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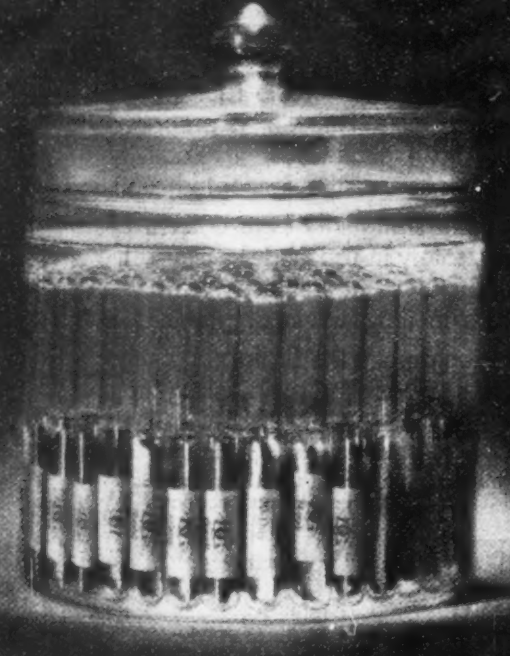

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THE

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The Morison Lectures

ON

NERVOUS SEMEIOLOGY, WITH SPECIAL REFERENCE TO EPILEPSY.

DELIVERED BEFORE THE ROYAL COLLEGE OF PHYSICIANS OF EDINBURGH ON JUNE 2ND, 3RD, AND 4TH, 1930,

BY

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LECTURE I.—THE RELATION OF NERVOUS SYMPTOMS TO NERVOUS LESIONS.

IT is my first and pleasing duty to express to the President and Council of the Royal College of Physicians of Edinburgh my deep appreciation of the signal honour paid me by the request to deliver the Morison Lectures. Scanning the list of my distinguished predecessors and the subjects chosen by them, I find that comparatively few have in recent years dealt with any special aspect of neurology, and I am glad to take this chance of submitting to the consideration of my confreres some matters bearing on nervous semeiology and on the interrelation of nervous symptoms and lesions to which I have long given thought. I do this with no little diffidence, however, because the general considerations to the importance of which I have become increasingly attached will doubtless appear to a number familiar and possibly axiomatic; yet they may prove not without interest as representing, in some degree, certain changes in my own views on fundamental problems of interpretation that concern every neurologist. There is also advantage in allowing oneself the leisure for a look round, seeing that the directional flow of a stream is not always appreciated by those whose attention is centred on eddies, pools, or backwaters.

As a tyro in the subject of nervous diseases I imagine I began with a conception based on clinical differentia; it seemed practical enough to separate cases in accordance with their particular semeiology; a given disease was represented clinically by a corresponding syndrome or symptom-complex, and even if specific modifications were found the generic picture could always be relied on for purposes of diagnosis. The typical syndrome of disseminated sclerosis was constituted by the old Charcotian triad of intention tremor, nystagmus, and scanning speech; that of tabes by Argyll Robertson pupil, lightning pains, ataxia, and loss of deep reflexes; of infantile paralysis by flaccid palsies, wasted muscles, and deformities; and so forth. Yet it did not take long to be convinced of the limitations of a purely clinical arrangement, for the fact was soon discovered that one and the same symptom can arise in conjunction with lesions at different physiological levels in the nervous system, and as a result of different pathogenic actions. Besides, experience showed the futility of the endeavour to circumscribe the clinical tableau of a given affection by a series of Procrustean lops. Epidemic encephalitis may be thought by some to be one and indivisible, but so far as its semeiology is concerned its manifestations are legion.

The next step, under the influence of honoured teachers of twenty-five years ago, was to rely on the well-tried clinico-anatomical method, to correlate symptoms during life with lesions found after death, and to assume (if not always to demonstrate) their essential consonance. I am the last person to decry the value of the method in its time, for there can be no doubt, in the first place, that such correlation (with certain provisos) is legitimate enough, and in the second, that its employment has led to discoveries and advances of the first importance. Indeed, I suppose the devotees of what has been called the necrological school of medical thought are as numerous as ever, and will continue to be reinforced by successive generations of medical students unless and until their preceptors are sufficiently emboldened to point out its rather misleading assumptions. The method, if I mistake not, is becoming just a little *démodé*, although years have already elapsed since that shrewd observer the late Sir James Goodhart wrote a paper on "The passing of morbid anatomy," which exercised more than a transient influence on my own views. Hopeful lines of present-day research are directed to study of the living in preference to scrutiny of the dead, and some day diagnostic autopsies will be a reproach and not a satisfaction.

It appears to me incontrovertible that neither a clinical nor a pathological classification offers any particular advantage from the standpoint of nosology, and that the sole basis for the scientific arrangement of nervous disease is etiology. Yet this is precisely the department of investigation which lags behind. The causation of a large group of nervous affections is undiscovered, but until we find initiating factors we dare not begin to speak of such and such a clinico-pathological combination as constituting a disease. The day has passed for the physician to transform clinical syndromes and pathological complexes into diseases. For what is a disease? Obviously, it is neither the etiological excitant, nor the clinical *allure*, nor any underlying pathological change; and we may with Sir Humphry Rolleston allege that it is nothing else than a mental picture—a conception figured in the mind, a composite of elements no one of which by itself suffices to define. At any rate, we shall find great, nay, insuperable, difficulty in establishing disease entities unless we can prove that a given causative agent produces invariably and solely the same reaction in the body, exhibiting the same syndromes, and amenable to the same treatment.

THE PHYSIOLOGICAL NATURE OF SYMPTOMS.

1. It will, I think, be generally allowed that an etiological factor, a pathogenic agent, can be regarded physiologically as a stimulus, and physiology recognizes only three classes of stimuli—namely, pure excitants, pure depressants, and those which first excite and then depress. Accordingly, clinical symptoms are to be considered as representing either excitation or cessation of function, or a series in which the latter follows the former. Without exception, all are functional, in the sense of being related to function. To attempt to distinguish "functional" from "organic" symptoms is therefore meaningless. This, so far as I personally am concerned, is an ancient platitude; I date my awakening to a conversation with my old teacher, the late Dr. Charlton Bastian, who, when I told him a patient had been admitted under his care suffering from what I, with the dogmatism of the house-physician, described as "functional fits," replied: "Did you ever see a fit that was not functional?" I then secured an insight into semeiology which I trust I have never since failed to maintain. Whether we deal with motor, sensory, vegetative, or psychical symptoms, each and all are classifiable as consisting of either increase (inclusive of "escape") of function, or of decrease, and there is nothing else.

2. A symptom is the expression of a physiological reaction, and hence can never be specific unless we imagine

reactions themselves to be so—an impossibility when the unbelievable diversity of stimuli is born in mind. Take any banal symptom of neurology—headache, neuralgia, hemiplegia, paraplegia, amyotrophy, anaesthesia—everyone recognizes their production by a host of differing agencies. With advance of knowledge the alleged specificity of many a neurological symptom is steadily undermined, till we may well question whether any at all can thus be distinguished. An Argyll Robertson pupil is just as characteristic of collicular neoplasm as of neurosyphilis; the epileptic fit occurs as a semeiological incident in circumstances we should never dream of ascribing to a "disease" called "epilepsy"; intention-tremor is by no means confined to the subjects of disseminated sclerosis. I have not myself seen a case of rabies; but no one who is conversant with the graphic descriptions of older observers can fail to notice either the remarkable similarity of recorded cases as regards the dramatic consequences of any attempt to swallow fluids, or the overwhelming consensus of opinion that such symptoms are so pathognomonic of the disease as to provide it with one of its names. Here, however, is a recent account, reported by Fletcher and Fitzpatrick[1] in the *Lancet* of 1927.

"When he attempted to swallow the result was terrible. While we were examining him he asked for some iced water, but no sooner did he put the cup to his lips than he was seized with violent spasms of the throat, jaws, and left side of his face. The small amount of fluid which had entered his mouth was shot out again with a hissing sound; short, sharp hisses followed each other at intervals of about half a second. With each hiss the head was jerked forward by a spasm of the sterno-mastoids, and sometimes the hiss ended in a sharp sound like a bark. The patient must have remained in this torture for a minute or more," etc.

No feature of the spasms of hydrophobia is awanting, not even the bark; the case, however, was one of tetanus. Further comment would surely be superfluous.

3. Being the expression of a process (of excitation or depression, as the case may be) a symptom is likely to be fluctuating and variable; it may wax and wane, rise and fall; it need not be the same at each examination, and therefore any argument that "organic" can be differentiated from "functional" symptoms by their relatively unchanging character, or their persistent nature, or their being uninfluenced by factors of a different order, is at once vitiated. The tremor of paralysis agitans is as patently under the influence of emotional and other psychical stimuli as is that of hysteria; it may be present at one moment and absent the next (an observation made originally by James Parkinson[2] himself). A number of illustrations of this clinical fact were given in the Croonian Lectures[3] of 1925. Similarly, in cases of progressive lenticular degeneration I have had occasion to observe the remarkable "fluidity" of the tremor, which may leave one group for no apparent reason to develop forthwith in some other, separate, distribution. The tremor of hysteria, in point of fact, does not often itself exhibit such variability. Only when a structural change is permanent, when tissue reaction has come to an end, does a given symptom become stabilized or static. In itself it stands in no constant relationship whatever to underlying structural alterations. Thus may we observe a patient with disseminated sclerosis exhibiting ankle clonus one week and none the next; but even more illustrative instances are at hand. In the course of the cataplectic attack of narcolepsy the knee-jerks are abolished as completely, as "organically," as in a case of tabes with sclerosis of dorsal columns—yet only for a few seconds or minutes. One of my narcoleptic patients at hospital, a girl of 18, fell sound asleep in the ophthalmic room after I had been looking at her discs; during this sleep tapping her patellar tendons yielded one single, brief, and faint twitch, and thereafter they were totally irresponsive to repeated percussion; yet when she awoke, walked into another room, and sat down, the knee-jerks were found again to be brisk. Recent work by Jacobson[4] in the University of Chicago has proved that a normal subject may so relax himself voluntarily, may empty his muscles of tone to such a degree, that in the course of a few minutes the knee-jerks may be entirely abolished. I had occasion to sit by the bedside of an old gentleman of 70, who complained of recurring attacks of right-sided weakness; on my first examination he showed neither symptom nor sign of abnormality, but while I was talking to him he suddenly remarked, "It's coming back now," and a minute later he could move neither arm nor leg. I then found a characteristic extensor plantar response where a moment before it had been flexor, and the abdominal reflex disappeared. Ten minutes later, power returned, and once more the plantar reaction was in flexion.

From these and numerous examples that come to mind, which can surely be paralleled in the experience of most neurologists, I submit only one conclusion can be drawn—namely, that symptoms *per se* are the expression of dynamic alterations in function, and either may *or may not* coincide with structural change. To ascribe of necessity to structural lesions what we have been in the habit of thinking "organic" signs is therefore improper; only when the latter are residual and static is it legitimate to attribute to them such clinical phenomena. Otherwise, indeed, our talk of "recovery of function" is meaningless. A further conclusion is, that in themselves it is impossible to differentiate between symptoms due to dynamic and to static change; an extensor response which is present for five minutes, a knee-jerk which is absent for the same time, are indistinguishable from those that endure.

Defects of the Clinico-anatomical Method.

When we endeavour to link the clinical symptoms of illness with any tissue modifications found subsequently, our path is beset with pitfalls of a sufficiently obvious kind.

1. In the first place, we have to consider the precise nature of the semeiological picture during life. Adopting Jacksonian terminology, we must state whether the symptoms are "positive" or "negative"—that is, whether they correspond to enhanced or diminished function, to its presence or absence. Clearly, excitation of function cannot be associated with destructive lesions; the sole direct effect of the latter must be its abolition. When we find paralyses or anaesthesias or amyotrophies, we can properly assign them to interruption or disintegration of nervous tissues. But it is far otherwise with "positive" symptoms, of which a moment's thought will convince the clinician a large part of nervous semeiology is composed. These must be produced by the action of healthy mechanisms. To attribute the involuntary flexor spasms of a case of paraplegia to lesions in the pyramidal tract is illogical; for their occurrence integrity of lower spinal reflex arcs is essential. That is to say, a prominent *symptom* is produced by the action of a *healthy* mechanism. The problem of all involuntary movements (tics, chorea, tremor, epilepsy, myoclonus, athetosis, etc.) is a problem in physiology, and will never be solved by their ascription to destroyed cell-fibre systems. Or take another example: in the case of neuralgia, precisely what lesion do we expect to discover that can be correlated with it? Essentially a positive symptom, it must be caused by excitation (or release, if that is thought more accurate physiologically) of sensory mechanisms which must be in a state of health, not of depression. Can such cell-fibre systems be distinguished histologically from any others? What can we suppose is the state of the dorsal root ganglia in the persistent pains of tabes? Logic insists that a neurone or neurones responsible for the conveyance and experience in consciousness of impulses underlying pain must be histologically intact, and not in a condition of degeneration. To find such ganglia indistinguishable from any of the rest, so far as the cells are concerned, would be in no way surprising, but quite the reverse.

This provides, indeed, a sufficiently plausible reason for postulating a sensory inhibiting system of *efferent* type, as has been advanced by Foerster[5] and others, both before him and since; the suggestion then would be that de-inhibition of this system by destroying agencies would allow overaction on the afferent sensory system whereby pain (for instance) would be persistently experienced in consciousness.

What changes is it rational to expect in the spinal cord of a patient who has suffered from tetanus—I mean in

relation to his clinical symptoms? Not a few modern cases are on record (cf. Aschoff and Reinhold[6]) with either minimal cellular change or indeed with none that is recognizable. So far from this situation proving disconcerting, it is, I submit, entirely the other way. The purer the action of tetanus bacilli and toxins—that is to say, the less the histological picture is complicated by antitoxin, magnesium sulphate, or narcotic treatment during life—the more insignificant are the departures from cellular normality. If a patient dies from the affection we surely cannot expect to discover identical modifications in the cells whose activity has been responsible for tetanic spasms, and in those whose paralysis has caused death. In respect of the former we should postulate, and expect to find, integrity and not disease. Logically, once more, we should be unable to correlate a pronounced symptom with any lesion of the mechanisms producing it.

2. No constant relationship holds between size of lesion and amount of functional disorder. In a given case the most prominent clinical symptoms are by no means necessarily coupled with the lesions most apparent at the *sectio*. The widespread functional disturbance of a generalized major epileptic seizure, which ranges, in fact, from hallucination to micturition, stands in no proportionate relation whatever to any "lesion" that may subsequently be demonstrated. No connexion exists between the mass of a cerebral tumour and its symptomatology; some, for that matter, are discovered only after death. For the immense range of symptoms badly classed as "subjective" no objective basis is supposed to exist—though, of course, we know they must have a physiology.

3. The localization of a symptom, a functional system, and a lesion, is in each instance a different and separate thing; and herein lies one of the more serious shortcomings of the clinico-anatomical method. A capsular haemorrhage produces a paralytic hemiplegia; but any inference that motor function is confined to the pyramidal system is clearly erroneous. Its substratum extends far beyond that part a lesion of which is followed by motor symptoms of a negative kind. When the contractured fingers of the hemiplegic hand open in extension as the patient yawns the symptom (an involuntary movement) has nothing to do, *qua* localization, with a thrombosis on the pyramidal path. The phenomenon of micrographia doubtless is a symptom of some cases of Parkinsonism, post-encephalitic or otherwise, but it is also found in cerebral arteriopaths, in hemiplegics, and in normal subjects. How, then, in the name of all that is logical, can it be "localized" in the corpus striatum, as some would maintain? The same considerations hold good in respect of the sensory system; we "refer" or "localize" sensory symptoms to or in various parts of the body, whereas, as a fact, every sensation is a presentation in consciousness, and therefore of, let us say, cortical site. Yet the lesion stands in no spatial relation thereto. Central pains arise in association with a lesion which may be situated in spinal cord, pons, or thalamus; but, whatever its position, it cannot correspond to the place where sensation is being experienced.

Symptoms, lesions, and functional systems are not comparable, cannot be, as it were, superimposed one on the other, and obey differing rules of localization. It would be a simple matter to amplify the contention by a further series of illustrations, but one must suffice. For a number of years many writers, more especially on the Continent, have been assigning post-encephalitic tics to destructive lesions of the putamen or caudate nucleus. Now such a view can be shown to be doubly or triply erroneous; for in the first place a tic is a positive movement and must be caused by activity of motor cells; it cannot be assigned to those that are dead. Secondly, it represents a mode of activity of the motor system, and as such its intrinsic clinical characters compel us to place it at a high level in that system, certainly not at an infracortical site. Thirdly, it exemplifies escape of motor function from control, and if a lesion is to be sought therefor, that lesion may be situated in transcortical inhibitory mechanisms far removed anatomically from the region whose healthy activity is causing the tic. No adequate reason perhaps exists for seeking any recognizable *lesion* for habitual movements, tricks of motor type, mannerisms, stereotypies; if there be any at all, it is one which is responsible for de-control only, and unfortunately we do not know what and where that may be; we postulate transcortical defect without being able to specify it.

There is, however, a still more radical objection to the mode of thinking which associates physiological symptoms with visible lesions. We must, I believe, definitely concede that in respect of the motor system (say, the motor region of the cortex) excitation can produce immediately obvious motor symptoms, whereas limited destructive lesions of the same part may not cause any paralysis. Movements are represented over relatively wide areas, and unless the part destroyed is sufficiently large it may not effect any interference with movement production. Thus small lesions in cerebellum, corpus striatum, or cortex itself may not be responsible for any discoverable symptom if the function or functions concerned enjoy a wide representation. To link a lesion of such a kind, therefore, with the active manifestation of a movement is an unsound and indefensible proceeding. I am tempted to add another corroboration of the general argument of value because it concerns a negative symptom—namely, agraphia. For my present purpose the term may be taken to signify inability to write correctly as regards formation of letters and words. Say that this occurs in consequence of a stroke with right hemiplegia in a right-handed person. Assume that his incapacity is not so severe as to prevent his holding the pencil properly enough, and that he has preserved in his mind the necessary ideas, but—he cannot write. To ascribe this symptom to a destructive lesion which may be found post mortem in the left hemisphere is facile, and the corollary is practically certain to be drawn that the area involved is a "writing centre." But surely here is a complete *non sequitur*. Have we tried our patient's left hand? If he can write with it, there is no agraphia at all. Have we thought of trying him with his toes? It is relatively easy to write with the foot if the pencil is suitably fixed, and in even more unexpected ways—for example, with the pen between the teeth. I have a pen-and-ink signature thus written solely by movements of the head, executed by a soldier with complete traumatic quadriplegia. Where, then, is the writing centre? At the least, it is not where a destroying lesion interferes with conduction to the right arm and hand. Did not Grock, the French clown, play the piano with his nose? And if a lesion were to obstruct the route from temporal lobe to neck muscles, would he suffer from amusia?

4. A further frequent misunderstanding in respect of clinico-anatomical correlation is concerned with the question of time. I know well, of course, that one lesion can often be shown to be older than another in the same brain, but this declaration is of minor significance compared with the inability of the neuropathologist to do more than present a static tissue-picture in contrast to what has consisted in life of a physiological progression, a series of functional events. The temptation is almost irresistible to set a pronounced clinical symptom alongside an obvious structural change without considering the approximate time of development of either. If yielded to, the result may be unfortunate. A striking example comes to mind. The average duration of a case of rabies is only three days if incubation occupies less than thirty, and only four when more than sixty—in either instance extremely brief. Some recent studies (cf. Schükri and Spatz[7]) have demonstrated conclusively that even without that short period of four days the substantia nigra is the most heavily implicated of all affected regions; many of its ganglion cells are totally disintegrated and glial scavenger cells packed full of melanotic pigment. This simple fact—namely, that degeneration and disappearance of the cells of that structure are seen in acute rabic cases well inside a week—at once renders extremely suspect any ascription of the Parkinsonian syndrome of epidemic encephalitis to their absence in that affection, since (apart from the definitely positive nature of the syndrome) it leaves out of account the fundamental question of the time factor. Should the objection be raised that the comparison is of two different morbid affections, I may point out that in epidemic encephalitis Greenfield[8] has noted destruction of these cells by the twenty-third day. When Parkinsonism develops, say, two years after the acute attack, and at a *sectio* five years later outfall of the cellular

elements of the substantia nigra is apparent, how can we allege clinico-anatomical relationship if we do not know at what time they disappeared? Without such knowledge we are committing the easy error of setting in juxtaposition merely the obvious symptom and lesion and of ignoring the time component.

But there is another aspect of the same topic that merits attention. A syndrome whose unrolling involves the idea of succession in time cannot be localized by spatial rules. Discussing this point, Monakow and Mourgue[9] take as illustration a musical box, in which dissonance can be produced (1) by absence of one or more projections on the rotating brass cylinder, (2) or absence of teeth in the vibrating comb, (3) or by changing the position of the latter in relation to the former to right or left. Incidentally, we have here a useful proof of the fact that one and the same symptom can be caused by changes at different physiological levels, as already remarked. All such possibilities effect alterations in temporal succession and modify the melody; but if the question is asked, "Where is the melody localized?" it is seen to have no meaning. Its "localization" is chronogenic. Some time ago neurologists were seeing cases of post-encephalitis characterized by inversion of sleep rhythm—a rather difficult symptom to deal with, and often extremely pronounced; the youthful patients were sleepy or asleep during the day, and became imps of mischief during the night. Here is a symptom, definite and special, but where is it localized? One has only to set the question to perceive its absurdity. And this leads naturally to the cognate question of narcoleptic phenomenology. In view of the fact that all of us sleep for a number of hours during the twenty-four, what exactly do we expect to find should such a case come to necropsy? I cannot see that occasional or even frequent diurnal sleeps are calculated to effect any persisting morphological change in nerve cells; and if none is recognizable what becomes of the relation of symptoms to lesions? It is perfectly clear that the narcoleptic patient is suffering from a derangement of sleep rhythm, a hypersomnia which is merely an exaggeration of a condition recurring normally in every one of us every day, and I submit that that disorder of the processes of sleep constitutes a symptom embodying the idea of modification in time and cannot be interpreted by reference simply to static change. Even if organic lesions are seen post mortem in a case characterized by pathological sleep—as occurs often enough—it behoves the neurologist to proceed warily in his correlation of the two. To explain alterations in time processes by morphological tissue change is strictly an illogical procedure.

We have thus seen how lesions can be present without recognizable symptoms, and symptoms without recognizable lesions. So far, however, from being nonplussed thereby, I am clearly of the opinion that not only is this to be expected, but that it also throws light on the true nature of what in a superficial way is termed "disease." Rather should any scientific parlance employ the term "reaction" as explanatory of symptom-lesion relationship; and it is informative to note that some present-day psychiatrists—dissatisfied with Kraepelinian conceptions—now speak of paranoid reaction types, schizophrenic reaction types, etc., instead of paranoia, schizophrenia, and so on, once thought to constitute actual disease entities.

Interpretation of Neuropathological Change.

Since no specificity, as we have found, attaches in a general way to nervous symptoms, their causation being—again speaking generally—multiplex, the homologous question of whether pathological changes can be considered specific becomes of much interest. My submission is that they cannot so be regarded; that they are nothing else than tissue reactions to noxious agents; classifiable no doubt in certain groups, they form none the less merely a series of pictures, the features of any one of which are as a fact common to numerous others.

We may begin by looking for a moment at cellular change. Now Nissl himself, who at first hoped for and believed in an unvarying correspondence between specific poisons and specific cell alterations, was compelled in the end to concede that similar or identical changes can be brought about by a whole series of etiologically distinct factors—an admission that must be fully accepted by everyone who has any knowledge of the subject. The statement of Dejerine,[10] made as long ago as 1897, that "la chromatolyse de la cellule nerveuse est une lésion banale, intéressante au point de vue cytologique, mais jusqu'ici, du moins, ne répond à aucun phénomène physiologique et, partout, pathologique déterminé," is for practical purposes almost as true to-day as it was thirty years ago. I need scarcely point out, by way of illustration, that swelling of the nerve cell occurs in fevers, alcoholism, botulism, strychnine poisoning; diffuse coloration of the achromatic substance in diphtheria, lead and phosphorus poisoning, and various mental affections; vacuolation in toxicosis from cocaine, morphine, chloroform, and in such infections as rabies, cholera, plague; enlargement of the nucleus in burns, uraemia, cholaemia; nuclear shrinkage in poisoning by arsenic, alcohol, etc., and in eclampsia; nuclear displacement in pneumonia, typhus, morphinism, cocainism; and so on and so forth. None of these reactions are mutually exclusive, none a feature of one class more than another.

Or take the mesodermal—that is, conjunctivo-vascular—reactions, considered nowadays to form the correlate of inflammation in the central nervous system. Here are included cellular infiltrates and exudates as well as glial and other hyperplasias. Assuredly there is nothing whatever specific in respect of these pathological "lesions," for they are a banal feature of the action of such totally different etiological factors as those of syphilis, tubercle, rabies, trypanosomiasis, poliomyelitis, and what not. Under the microscope it is impossible to distinguish rabies from epidemic encephalitis; the cortex of tuberculous meningo-encephalitis—so far as mesenchymal change is concerned—bears the closest resemblance to that of general paralysis. Or take the glial knots and nodules once imagined characteristic of typhus; they are found as a fact in a whole series of diverse pathological states associated with toxi-infective conditions—the very latest being yellow fever (cf. Jakob and Fialho[11]). And what of perivascular demyelination? It is seen in Schilder's encephalitis, in disseminated sclerosis, neuromyelitis optica, post-vaccinal encephalitis, some cases of measles encephalitis, and the vague "acute disseminated encephalomyelitis" that is once again arousing interest. Whether one or other of these is or is not accompanied by other reactions that may conceivably serve to differentiate is immaterial to my argument; I urge strongly that the data allow of only one conclusion—namely, that perivascular demyelination is itself nothing else than a tissue reaction common to a number of conditions which differ clinically *toto caelo*; it cannot be taken by itself, and of itself, to constitute a disease in any scientific sense. When my friend and colleague Dr. Godwin Greenfield,[12] in his latest contribution to this subject, declares that "acute disseminated encephalomyelitis is a disease *per se*, which may be brought on or directed against the nervous system by certain febrile or exanthematous diseases," I answer that he is erecting a mere tissue reaction into a disease, contrary to all the canons of nosology; and that his assumption that one *disease* can "bring on" another *disease* demands the most critical scrutiny. Only if proof were one day forthcoming of the causation of this particular histological reaction by one and the same virus, invariably, inevitably, and uniquely, could it possibly attain specific value.

But illustrations need not be multiplied. This general conception of the essential non-specificity of neural tissue reactions, whether mesenchymatous or parenchymatous, has so impressed me for a long period now by its substantial truth that I consider it unassailable. The newest corroboration comes from the distinguished neuropathologist of Munich, Professor Spielmeyer[13]; I quote from his Mayo Foundation Lecture of December, 1929.

> "The same alterations are found in a lesion from trauma, intoxication from carbon monoxide, intoxication from morphine, chloroform narcosis, hypertension, pseudo-uraemia, and other spasmodic conditions. Always the same alterations are seen. They are different only according to their age and intensity. When in the past they sometimes seemed to be different in

localization and there seemed to be something really typical in them, further experience showed that that was an error. *So these findings mean nothing in the definition and classification of disease entities.* Their fundamental value, rather, consists in showing something common to all these diseases, *etiologically and clinically so very different*; not anatomical forms of disease, but similar pathogenic complexes. . . . It can be seen how the most varied injuries, by a more or less long chain of causes, finally lead to the same pathophysiolcgical process." (Italics mine.)

These are weighty words; they represent with exactness the conclusions I myself reached some time ago; though applied by Spielmeyer more especially to vascular disturbances, they stand for a principle capable of much wider application. What the neuropathologist sees is a tissue response, the expression of a pathophysiological process; one and the same process is capable of being called into being by etiological factors differing among themselves and causing clinical symptoms also differing in their type.

One or two other questions of pathological interpretation remain for brief allusion.

Such expressions as "acute haemorrhagic encephalitis," "acute disseminated encephalomyelitis," "acute parenchymatous degeneration," and other analogous terms, are merely descriptive *names* for pathological reactions; they correspond pathologically to such clinical expressions as "headache" or "paraplegia," and are devoid of meaning from a nosological or etiological standpoint. And it is of prime importance to note that *differing* reactions may and do sometimes occur in the *same* affection. For example, parenchymatous degeneration without obvious mesodermal hyperplasia characterizes some cases of epidemic encephalitis, as is now fully recognized; further, a number of disease conditions—for example, epidemic encephalitis, rabies, neurotubercle, neurosyphilis, and still others—may exhibit both types of reaction in one and the same case, in different parts of the neuraxis, and seemingly in complete independence of each other. Attention has lately been directed by Jakob,[14] Spielmeyer,[15] and other workers to the occurrence in the cortex of regions of general parenchymatous necrobiosis, pale or bleached in appearance, often without well-delimited margins, and visible only in Nissl preparations. They are best seen with a low power. Whether they are of vascular origin does not concern us for the moment; what is significant is their identical development in morbid conditions that differ fundamentally in etiology and in clinical character, and their coexistence with, but separation from, reactions of mesenchymal type. Clearly, the inference is again justified that some of the morbid states which we have thought constituted disease entities possess no specific pathological reaction on which to base that assumption; while, on the other hand, a seemingly definite pathological reaction is common to a number of diverse clinical states.

A final consideration bears on the question of modifications undergone by nerve cells during the normal activities of life and after dissolution has set in. Histological differences between resting and actively functioning cells are sufficiently well known; an extensive series of studies by Dolley[16] has demonstrated the orderly sequence whereby changes in the quantity and distribution of chromidial substance and variation in the nucleus-plasma ratio are natural results of activity and depression. After activity, indeed, a cell may be practically dechromatinized and yet recover its full complement of chromatin during rest. The details of these changes need not delay us, but their import should not be overlooked. For in the examination of nervous tissues after death departures from the pattern of the resting cell do not all of necessity indicate the existence of pathological circumstances; on the contrary, they may equally well be physiological, and equally, therefore, indicative of health and not of disease.

Analogously, it becomes of cardinal importance to note that in toxic conditions, as well as in "natural" conditions, changes take place in nerve cells in accordance with the period after infection at which tissues are fixed and examined. This has recently been well demonstrated by Barros.[17] He has injected tetanus toxin into guinea-pigs and shown by the microscope that if the tissues studied are fixed two hours after inoculation the ganglion cells of the spinal cord yield a normal Nissl picture; if after six and a half hours, the cell exhibits early chromatolysis; if after seventeen, it presents much more definite resemblance to the ordinary picture of a toxically degenerating cellular element. Evidently a toxin may be at work dynamically interfering with cell function before histological change can be detected.

The general bearing of these various observations, to which some discussion has been allotted, will not escape the inquiring mind. They indicate the desirability, nay, the necessity, of regarding "disease processes" as calling forth vital efforts to cope with noxae; many symptoms are proof of health, many "lesions" are evidence of attempts at repair. Along such lines of thought, I believe, we shall gain a truer insight into the activities of the nervous system.

REFERENCES.

[1] Fletcher, W., and Fitzpatrick, J. P.: *Lancet*, 1927, ii, 545.
[2] Parkinson, James: Essay on the Shaking Palsy, 1817.
[3] Wilson, Kinnier: *Lancet*, 1925, ii.
[4] Jacobson, E.: *Progressive Relaxation*, 1929.
[5] Foerster, O.: *Die Leitungsbahnen des Schmerzgefühls*, 1927.
[6] Aschoff and Reinhold: *Die Veränderungen der motorischen Ganglienzellen beim Wundstarrkrampf*, 1922.
[7] Schükri, I., and Spatz, H.: *Zeit. f. d. g. Neurol. u. Psychiat.*, 1922, lxxvii, 148.
[8] Greenfield, J. G.: *British Medical Journal*, 1927, ii.
[9] Monakow, C. V., and Mourgue, R.: *Introduction biologique à l'étude de la neurologie*, 1928.
[10] Dejerine, J.: *C. R. Soc. de Biologie*, 1897, 399.
[11] Jakob, A., and Fialho, A.: *Deut. Zeit. f. Nervenheilk.*, 1929, cxi, 111.
[12] Greenfield, J. G.: *Journ. Path. and Bact.*, 1930, xxxiii, 453.
[13] Spielmeyer, W.: *Proceedings* Staff Meeting, Mayo Clinic, 1929, iv, 361.
[14] Jakob, A.: *Normale Anatomie und Histologie und allgemeine Histopathologie des Grosshirns*, 1927.
[15] Spielmeyer, W.: *Zeit. f. d. g. Neurol. u. Psychiat.*, 1930, cxxiii, 536.
[16] Dolley, D. H.: *Journ. Med. Research*, 1911, xxiv, 309.
[17] Barros, E.: *Zeit. f. d. g. Neurol. u. Psychiat.*, 1924, xciii, 720.

INFLAMMATION OF THE DIAPHRAGM.*

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(With Special Plate.)

INFLAMMATION in the neighbourhood of and implicating the diaphragm is fairly common, but the symptoms resulting vary enormously in their severity; they may be anything from a slight discomfort in the side to those suggestive of an acute abdominal condition. Some of the cases which I have chosen to call chronic may exist, I think, without any symptoms, while some of the misleading and urgent symptoms of acute pneumonia may be the result of implication of the diaphragmatic pleura in the inflammatory process. For descriptive purposes I propose to divide the subject into two parts: (1) Inflammation of the upper surface, or diaphragmatic pleurisy. (2) Inflammation of the under surface, or subdiaphragmatic abscess. It must, however, be remembered that inflammation of the upper surface may produce symptoms resembling an acute abdominal condition, and that inflammation of the under surface may, on account of the distribution of the phrenic nerve, produce pain about the shoulder in the supraclavicular region.

It would here be convenient to remind you of the innervation of the diaphragm. Excluding the sympathetic fibres, the diaphragm receives branches from (*a*) the phrenic nerves, (*b*) the lower six or seven intercostal nerves. The phrenic nerve arises from the third, fourth, and fifth cervical nerves, but mainly from the fourth. It arises from the same segment of the cord from which the supraclavicular region receives its cutaneous nerve supply, thus accounting for pain being referred to the supraclavicular region—the so-called shoulder-tip pain of diaphragmatic pleurisy. On reaching the diaphragm most of the phrenic nerve fibres pierce it and are distributed on its abdominal surface. The phrenic nerves contain afferent

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as well as efferent fibres, the former constituting about one-third. They are the sole motor supply of the diaphragm in man. Their sensory fibres are more limited, and are mainly distributed to the more central part, and particularly to the more central part of the abdominal surface; and the fact that the shoulder-tip pain previously referred to is the result of irritation of the branches of the phrenic is of interest, in that it indicates that the central part of the diaphragm is affected. Branches from the lower intercostal nerves can be traced into the diaphragm. It is doubtful if they contain any efferent fibres, but their afferent innervation is of interest. Their sensory field is the more peripheral part of the diaphragm. Irritation of this part of the diaphragm is therefore more likely to induce pain in the cutaneous distribution of the lower intercostal nerves, which embraces not only the lower costal region, but includes, of course, the anterior abdominal wall, and in that way may lead to difficulties in diagnosis.

DIAPHRAGMATIC PLEURISY.

In view of the wide variation of the symptoms of this condition I propose to subdivide it clinically into (*a*) acute, (*b*) subacute, and (*c*) chronic.

(*a*) *Acute.*

The onset is very abrupt. The patient is seized with severe pain and vomiting. The pain in a typical case is referred to the lower costal region, but it frequently extends to the upper abdomen and tends to radiate round the lower thorax, and, if the central part of the diaphragm be implicated, pain is also complained of in the supraclavicular region of the shoulder on the same side; it does not radiate to the shoulder, but is felt there in addition to being felt in the lower costal region; in this way it can be distinguished from the pain of acute cholecystitis, which seems to pass through the side as if a red-hot stilletto had been plunged through the liver to come out at the lower end of the scapula. Again, the pain in acute cholecystitis is, at its height, often referred to the epigastrium, whereas, when it has subsided a little, it tends to be located over the gall-bladder. It may happen, however, that the initial pain is referred almost entirely to the abdomen, the patient making little or no complaint of pain in the lower costal region. It is in these cases, particularly if vomiting is a conspicuous and urgent symptom, that great difficulty in diagnosis is apt to arise, and operations may be undertaken in the mistaken belief that the case is one of appendicitis, cholecystitis, or even perforative peritonitis or acute haemorrhagic pancreatitis, according to the situation of the pain, though usually in these conditions the degree of abdominal rigidity is greater than in diaphragmatic pleurisy. Of all the conditions the pain is perhaps most intense in acute haemorrhagic pancreatitis. There is usually moderate pyrexia, though this does not appear to be essential at the outset, as is instanced by the following case.

A woman, aged 41, complained of severe pain in the left lower costal and left upper abdominal regions, associated with urgent vomiting. The history was that four days previously, after a supper of veal and ham pie, she went to bed feeling in her usual health. In the middle of the night she woke with what she described as "terrible pain" in the left lower costal region and "could not get her breath." About 9 a.m. she began to vomit, and vomited so violently that she fainted. From this time onwards she had vomited everything she had taken. At first there was no pyrexia, and not until two days after the onset did the temperature rise to 99.6°. It then continued to rise gradually until, when I saw her on the fourth day, it was 102.8°; the pulse was 112 and respirations 20. Examination revealed marked hyperaesthesia over the left costal margin and left upper abdomen, but no striking rigidity. A diagnosis of diaphragmatic pleurisy was made, which apparently was correct, for the next day a friction rub made its appearance on the left side. Ultimately the patient made an uninterrupted recovery.

The pulse is rapid and small. The breathing is impeded, but not always appreciably accelerated, and is often entirely thoracic. The skin over the painful area is markedly hyperalgesic, so that touch or light pressure causes intense pain, whereas firm pressure with the hand is infinitely less painful, and may even give relief. The absence of abdominal rigidity is most striking, and this, combined with hyperalgesia of the skin and the character of the breathing, is of the greatest service in differentiating from an acute abdominal condition. Later the diagnosis is often put beyond doubt by the detection of a friction rub at the base or by the supervention of unmistakable signs of pneumonia.

Treatment.

Once the diagnosis is established, it is advisable, if the pain is very acute, to give a dose of heroin or morphine hypodermically and to apply a fomentation locally.

(*b*) *Subacute Diaphragmatic Pleurisy.*

In these cases the pain is not so severe. It is located in the lower costal region, with or without referred pain in the supraclavicular region of the shoulder. As a fairly typical example I would quote the following case, which I saw on January 9th, 1925.

The patient was a schoolgirl, aged 15, with a history of having contracted a cold five days previously. Three days later she complained of severe pain in the left lower costal region, which, in the course of the day, was referred to the outer side of the left shoulder but did not affect the arm. The temperature was 99°. She had a slight, a very slight, cough, but no expectoration. The pain in the costal region was greatly intensified by breathing. When I saw her the temperature was normal; the respirations were short and rather rapid—namely, 26. The chest over the lower costal margin was tender, but there was no friction sound. The outer side of the left shoulder was also slightly tender, but there was no swelling, and the movements at the joint were good. There was no affection of any joints. The next day a friction sound was heard at the base of the left lung.

In some cases the pain over the shoulder is the first to make its appearance.

A patient, admitted to the Manchester Royal Infirmary on June 18th, 1927, for right-sided pleural effusion, gave a history that, four weeks previously, he was seized with sharp stabbing pains at the top of the right shoulder which lasted for two hours and recurred frequently until, a day or two later, pain began in the lower costal region.

(*c*) *Chronic Diaphragmatic Pleurisy.*

This group comprises those cases in which old adhesions exist between the visceral pleura and the diaphragm.

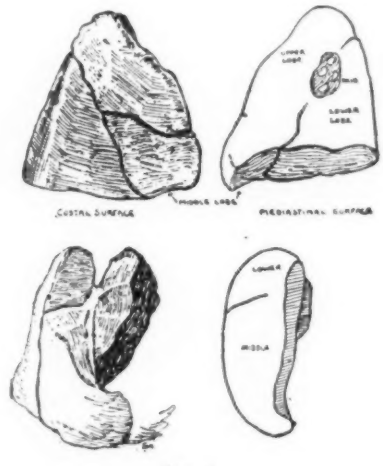

FIG. 2.

Many of these cases do not appear to give rise to any symptoms. In others the presence of certain symptoms may lead one to suspect the presence of adhesions, but the diagnosis can only be established when confirmed by *x*-ray examination. The patient may complain of a frequently recurring sharp pain in one or other lower costal region, with occasional pain in the supraclavicular region of the shoulder, which, if present, is a great help in diagnosis. Examination will reveal some impairment of movement with diminished air entry at the base of that lung. There are three main types of these adhesions as revealed radiologically.

Type 1.—Adhesions between the diaphragmatic surface of the pleura and the diaphragm. These adhesions may occur at any point, but not uncommonly may be seen (Fig. 1), in a radiogram taken laterally, as pointed out by Twining,[1] to extend from the diaphragmatic part of the fissure between the upper and lower lobes on the left side or between the middle and lower lobes on the right side, causing "tenting" of the diaphragm. The oblique fissures were shown by Kreuzfuchs and Schuhmaker[2] to extend to the diaphragmatic surface of the lung (Fig. 2).

Type 2.—Adhesions along the periphery of the diaphragm or at the costo-phrenic angle or mediastino-phrenic angle hooking up the diaphragm (Fig. 3). The following case is an example.

A foreman calico printer, aged 41, complained of tiredness, shortness of breath, pain in the left side on yawning or sneezing, and occasional sharp pain at the tip of the left shoulder. The history was that four months previously he had dry pleurisy at the base of the left lung, and that ever since he had run an intermittent temperature, rising in the evening to between 100° and 101°, with occasional night sweats and steady loss of weight. Cough had only been very slight and accompanied by very little expectoration, which had on three separate occasions been examined for tubercle bacilli with negative results. Examination revealed deficient movement, impaired resonance, and diminished breath sounds at the left base, but no adventitious sounds and no cardiac displacement. *X*-ray examination of the chest showed the left diaphragm to be fixed, and obliteration of the left costo-phrenic angle with some pleural thickening.

Type 3.—Adhesions arising from the mediastinal surface of the lung and connecting it with either the diaphragm or, as mentioned above, with the pericardium (Figs. 4 and 5).

The explanation of the formation of the adhesions arising from the interlobar fissures is interesting. In an antero-posterior view a pleural effusion is represented in a radiogram by a more or less uniform shadow, and if the effusion is insufficient to fill the chest the shadow is seen to have a convex upper margin rising to its maximum height in the axillary line. Fleischner,[3] however, has shown that, in a lateral view, this shadow may be seen to dip into the interlobar fissures, the effusion having separated the lobes of the lung by invading these fissures (Fig. 6). In some cases this interlobar exudate disappears entirely by absorption, in others it becomes organized, and in this way is, I believe, responsible for the formation of adhesions arising from the fissures. Such adhesions, we have seen, may connect an interlobar fissure with the diaphragm or with the pericardium, and may, by their contraction, cause so-called "tenting," though actually this is very slight, for careful examination shows that the "tent" is composed almost entirely of adhesion.

Subdiaphragmatic Abscess.

Any abscess in contact with the under surface of the diaphragm (except when in the liver or spleen) is spoken of as a subdiaphragmatic abscess. Such an abscess may be either right-sided or left-sided, and may, in addition to pus, contain gas (Fig. 7). These characteristics will, in great measure, be determined by the underlying cause of the abscess. The commonest cause of subdiaphragmatic abscess is perforation of a peptic ulcer, the resulting abscess being usually on the left side, and in view of the direct communication with a hollow viscus will contain gas in addition to pus.

The perforation may be subacute or acute, for the relief of which immediate operation may have been performed. Hurst and Stewart,[4] in dealing with this subject, while admitting that immediate operation for gastro-duodenal perforation has enormously reduced the mortality of this complication, doubt if the frequency of subdiaphragmatic abscess has been appreciably affected, the process of loculation having begun before the patient is seen by the surgeon, or the peritoneal drainage provided being inadequate. Later in the same article, when discussing the symptoms, they state that "if the temperature remains raised, or if after an initial fall it rises, and symptoms of a general infection occur about the fifth day after an operation for a perforated ulcer, a localized abscess is probably forming. If abdominal and rectal examination show that there is no obvious local abscess in the abdomen or pelvis, a subdiaphragmatic abscess is probably present."

When the perforation in the original peptic ulcer is very small the resulting abscess may not contain gas.

Of the other causes of subdiaphragmatic abscess, perhaps one of the most frequent is the tracking up of an appendicular abscess. These abscesses are usually on the right side and are non-gas-containing, though it must be remembered that occasionally such an abscess may contain gas as the result of infection by putrefactive bacteria.

Symptoms and Signs.—The general symptoms of subdiaphragmatic abscess are those of a collection of pus anywhere in the body, and consist of languor, loss of appetite, emaciation, constipation, and dry furred tongue, with irregular pyrexia and rapid pulse, sweating, and occasional rigors. The onset and signs and symptoms, however, will vary with the cause and situation of the abscess. In cases following an appendicular abscess, or the operation for perforation of a peptic ulcer, the onset is usually insidious. If five or six days after the operation pyrexia persists without any local condition to account for it, and the patient complains of pain in the lower costal region, with impeded, though not necessarily accelerated, breathing, the formation of a subdiaphragmatic abscess should be suspected. The subsequent signs will depend upon whether the abscess is situated posteriorly, when the signs will be mainly thoracic, or anteriorly, when they will be mainly abdominal. With a posterior abscess an area of dullness appears at the base of the lung and gradually increases in size, but the upper border of the dullness, being limited by the diaphragm, retains the curve of the diaphragm but with an increased convexity, and does not rise towards the axilla as in the case of pleural effusion. Again, the apex beat is displaced upwards, and not laterally as in cases of pleural effusion. Not uncommonly, however, a subdiaphragmatic abscess is complicated by the pressure of pleural effusion, and when this occurs the convex upper border of the diaphragm cannot be defined by percussion, and the apex beat is displaced laterally as well as upwards. Over the area of dullness there is marked tenderness, which, as pointed out by Hale-White,[5] is a very valuable sign. Owing to compression of the lung there may be bronchial breathing, and sometimes, as a result of concomitant pleurisy, a friction sound may be heard. If the abscess is on the right side the liver may be palpable; if on the left side, the usual resonance of the stomach and splenic flexure of the colon may be replaced by dullness. Exploration in the tenth intercostal space in the axillary line—the needle being pushed boldly on through the diaphragm—may reveal pus, though such a procedure is not without the risk of infecting the pleural cavity. When the abscess is situated anteriorly, a rounded tender swelling may be felt in the upper part of the abdomen and the thoracic signs may be insignificant. Such a swelling should not be punctured. Should the abscess contain air as well as pus, the signs of pyopneumothorax are present. *X*-ray examination will prove of the greatest value in the diagnosis of a gas-containing abscess, and reveals an air-containing space, separating the arched raised diaphragm above from the flat-topped shadow of pus below. In simple or non-gas-containing abscesses *x*-ray examination is not so helpful, for, as a rule, all that can be seen is that the diaphragm is elevated, fixed, and immobile, while any shadow below the diaphragm cannot be distinguished from the liver shadow.

Prognosis.—In all cases of subdiaphragmatic abscess the outlook is grave, but more so in those cases which contain gas as well as pus.

Treatment.—Surgical.

I am indebted to Dr. E. W. Twining, honorary radiologist to the Manchester Royal Infirmary, for much valuable assistance, and for the radiograms reproduced on the Special Plate.

References.

[1] Twining, E. W.: Interlobar Pleurisy. A paper read before the Section of Electro-therapeutics, Roy. Soc. Med., London, December, 1927.
[2] Kreuzfuchs und Schuhmaker: Die topographischen Verhältnisse der interlobären Spalten der Lunge, *Acta Rad.*, 1, 1922, p. 284.
[3] Fleischner, F.: Die Mediastino-interlobare Pleuritis ein Häufiges Vorkommen bei der Mediastinal-drüsen-tuberculose, *Acta Rad.*, Bd. 3, 1924, p. 307. Das Röntgenbild der interlobären Pleuritis und seine Differential-diagnose, *Ergebnisse der medizinischen Strahlen-forschung*, Bd. II, p. 230.
[4] Hurst, A., and Stewart, M. H.: *Gastric and Duodenal Ulcer.* Oxford University Press.
[5] Hale-White, Sir William: Pleurisy, *Practitioner*, July, 1921.

HORSESHOE KIDNEY.

A REPORT ON TWO CASES.

BY

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(*With Special Plate.*)

HORSESHOE kidney is one of the most frequent of renal anomalies. Statistics obtained from the post-mortem room show ratios varying from 1 in 1,580 to 1 in 500 cases. The condition results from the fusion of either upper or lower poles of the two kidneys across the middle line. The fusion, in the majority of cases, is between the lower poles, and is composed either of connective tissue or of varying proportions of renal parenchyma, which usually lies anterior to the aorta and vena cava. The ureters, as a rule, are two in number, and arise from separate pelves. They pass downwards in front of the isthmus, and it is because of their unusual position and curvatures that a horseshoe kidney is said to be especially predisposed to such conditions as hydronephrosis, renal calculi, tuberculosis, and pyonephrosis.[1] Joly[2] states that stone is at least six times more common in horseshoe kidney than in normal organs.

The mere presence of a horseshoe kidney may give rise to symptoms, but these usually depend on pathological changes in the renal substance. In the first of the two cases here detailed, although extensive changes were present on one side, the condition gave rise to no symptoms whatsoever.

CASE I.

The patient was a man of 34. His medical attendant had found albuminuria during a routine examination which had been carried out prior to treatment for haemorrhoids. There was no evidence that this was of nephritic origin, and as it failed to respond to treatment he was referred to the urological clinic at the Royal Infirmary for investigation. A healthy-looking man, of medium build, he would admit to no urologic symptoms. Palpation of the abdomen revealed no tumour. *X*-ray examination of the urinary tract showed a large renal calculus on the right side, occupying an unusually low level. Examination of the urine showed some red blood corpuscles and epithelial cells, with scanty polymorphs in the bladder specimen. No organisms were seen on direct smear, and no growth was obtained on culture of specimens taken separately from the bladder and kidney. A bilateral pyelogram (Fig. 1) showed anomalies typical of a horseshoe kidney, with gross pathological changes in the right segment.

Description of Pyelogram (*Fig. 1*).—The two pelves lie adjacent to the vertebral column. On the right side the shadow of the calculus can be identified, lying behind the upper end of the opaque catheter at the level of the transverse process of the fourth lumbar vertebra. Above the level of the calculus is an extensively dilated pelvis. The calyces are also markedly dilated, and their axis is median instead of lateral. The ureter leaves the pelvis at the lateral, instead of the usual median, border. The pelvis of the left kidney is of an unusual truncated shape, and some of the upper and lower calyces lie median to it. The uretero-pelvic junction on this side is also at the lateral border.

Operation.

In November, 1928, the right kidney was exposed through a curved lumbar extraperitoneal incision. The upper pole, which appeared to be lower than normal, was separated from adhesions by blunt dissection, and delivered through the wound. On freeing the lower pole an isthmus of renal tissue could be felt extending between it and the lower pole of the left kidney in front of the great vessels. The ureter was found in front of the isthmus, and it was divided. Working from the anterior aspect, the renal vessels, which were irregular in their distribution, were cleared, divided between clamps, and ligatured. A clamp was now applied to the isthmus as near to the middle line as the incision permitted. The isthmus was then divided, immediately to the right of the clamp, and the kidney removed. A running suture was applied over the clamp, and, as the latter was withdrawn, the suture was tightened and tied. A tube was brought out through the upper angle of the wound, from the region of the cut isthmus.

The entire wound, except that part through which the tube passed, healed by first intention. During convalescence there was a continuous urinary leakage along the tract of the tube, and this, to a slight degree, is still present. The patient feels very well, his urine is clear, and he is actively engaged at his employment as an engineer. An examination of the removed kidney (Fig. 2) showed that one of the calyces had been cut across in the resected portion of the isthmus.

CASE II.

A labourer, aged 34, was referred to the urological clinic at the Royal Infirmary in December, 1929, complaining of pain in the back and haematuria. The pain was felt over the dorso-lumbar vertebrae, and had troubled him for three weeks only. It was not severe, but became aggravated after about an hour's work, which at that time consisted in stoking a furnace. He stated that during the first week following the onset of his pain the urine had been intermittently red, but that for the past two weeks it had been quite clear. Chemical examination of the urine showed a trace of albumin, but was negative for blood. Palpation of the abdomen revealed no abnormality, and pressure in the lumbo-costal angle on both sides did not elicit any tenderness. Plain *x*-ray examination of the urinary tract was negative. A bilateral pyelogram (Fig. 3) showed the anomalies associated with a horseshoe kidney, with a hydronephrosis in the left segment.

Description of Pyelogram (*Fig. 3*).—The left renal pelvis and middle calyces are extensively dilated. All the calyces, except the upper group, are directed medialwards. The ureter leaves the pelvis at about the mid-point of its lower rounded border. The right pelvis lies almost in contact with the transverse processes of the third and fourth lumbar vertebrae, and the uretero-calicine angle is diminished. The axis of the calyces is in the normal lateral direction, and the uretero-pelvic junction occupies the normal median position.

The hydronephrosis present was not considered sufficiently severe to demand surgical intervention. The patient reported recently for re-examination, when he still complained of suffering from back pains. He does not appear to be handicapped in any way, however, as a result.

For the carrying out of any successful surgical procedure on a horseshoe kidney a previous recognition of the existence of the renal anomaly is of distinct aid to the surgeon. The condition can seldom be recognized by abdominal palpation and Rovsing's sign; the causation of a characteristic pain by increasing the curvature of the lumbar spine or making the muscles of the back tense, which is relieved when the patient lies down, is not of much diagnostic value. The shadow obtained by the plain *x*-ray examination of a fused kidney is usually too indefinite to admit of an accurate interpretation. Pyelography is generally the only method whereby fusion can be recognized. The abnormalities present in a pyelogram of a horseshoe kidney are due to failure of rotation of the renal pelvis.[3] In consequence the axis of the calyces is median or anterior instead of lateral, and the ureter leaves the pelvis from its lateral or anterior aspect.

Access to a horseshoe kidney is best obtained by the retroperitoneal route. The anterior transperitoneal route, as suggested by Rovsing, gives a good exposure of the isthmus, which is the most difficult part to deal with. A grave disadvantage of this approach, however, is the exposure of the peritoneum to infection. This is obviated by the postero-lateral incision, the anterior limb of the incision being carried further forward than usual. This gives an adequate exposure and working field. In dealing with the isthmus the division should preferably be made in a wedge-shaped manner, so that the cut surfaces can be approximated. A urinary fistula should be a rare sequel to the division of the isthmus, for the calyces are generally confined to the upper and middle portion of the renal mass. The lower calyx, however, extended into the isthmus in the patient operated on by me (Case I), and was therefore cut across in the course of the resection. Israel, according to Judd, Braasch, and Scholl,[4] reported a similar case, in which one of the calyces was cut across in the removal of the transverse bar.

REFERENCES.

1 Young: *Practice of Urology*, vol. ii, p. 14.
2 Joly: *Stone and Calculous Disease of the Urinary Organs*, p. 133.
3 Braasch: *Urography*, p. 378.
4 Judd, Braasch, and Scholl: Horseshoe Kidney, *Journ. Amer. Med. Assoc.*, lxxix, 1922, No. 15, p. 1189.

ALBERT RAMSBOTTOM: INFLAMMATION OF THE DIAPHRAGM.

FIG. 1.

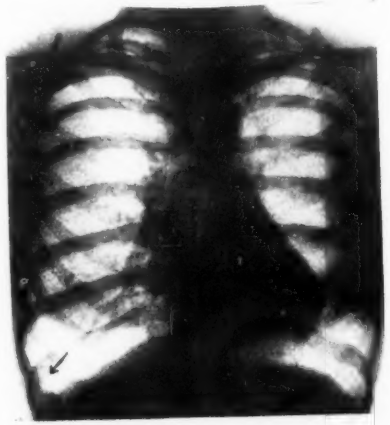

FIG. 3.

FIG. 4.

FIG. 7.

D. R. E. ROBERTS: RENAL CYST CONTAINING CALCULI.

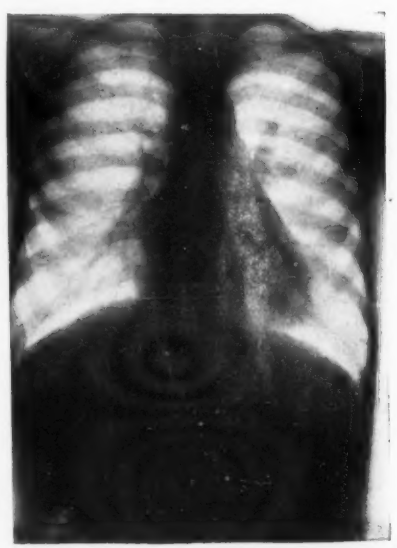

FIG. 5.

FIG. 6.

ARTHUR JACOBS: HORSESHOE KIDNEY.

FIG. 1.—Calculous hydronephrosis in the right segment of a horseshoe kidney. The anomalous axis of the calyces and the relation of the ureters are shown.

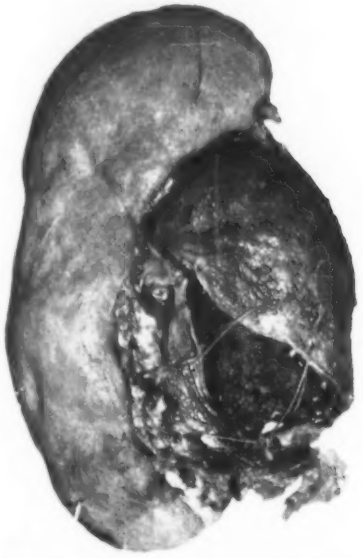

FIG. 2.—Resected segment of horseshoe kidney. The large calculus can be seen within the dilated pelvis, the anterior wall of which has been opened.

FIG. 3.—Hydronephrosis in the left segment of a horseshoe kidney.

J. SALISBURY CRAIG AND J. H. SHEARER: OSTEITIS FIBROSA.

FIG. 1.—Pathological fracture of left humerus. Areas of rarefaction in radius and ulna.

I. H. LLOYD-WILLIAMS: BOXER'S THUMB.

FIG. 1.—Radiogram of normal thumb, showing the normal position of the bones and sesamoids.

FIG. 2.—Radiogram of boxer's thumb. Note the space between the sesamoids and metacarpal and the subluxation of the phalanx.

FIG. 2.—Areas of rarefaction in right humerus, radius, and ulna.

[THE BRITISH MEDICAL JOURNAL

ON BOXER'S THUMB.

BY

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(*With Special Plate.*)

SUBLUXATION of the first metacarpo-phalangeal joint is a condition occurring chiefly among boxers, with whom it has attained almost the status of a stigma of the prize ring. It does, however, occur as the result of other accidents. The deformity may be either a primary condition, as with boxers, or a residual condition arising from a complete dislocation. In boxing the subluxation is produced by a blow on the distal portion of the thumb when it is not efficiently supported by the clenched fingers. The impact of a properly delivered blow should in no case directly affect the thumb, but it may be damaged by the opponent's guard.

Anatomy.

The head of the first metacarpal is somewhat flatter than the heads of the other metacarpals, and strong lateral ligaments bind it to the phalanx. Crossing the palmar aspect of the joint in question are the tendons of the adductor obliquus, opponens, and flexor brevis pollicis muscles. The first two are inserted by a common tendon into the ulnar side of the phalanx, and the short flexor into the radial side. In each tendon is a sesamoid bone provided with a separate synovial membrane for its articulation with the metacarpal. Below the sesamoids the tendons are fused together by fibro-cartilaginous tissue which is intimately attached to the anterior ligament and capsule of the joint. The capsule, which is lax in the flexed position, is drawn down during flexion and is thus prevented from being caught between the bones. Situated dorsally are the extensors and a weak ligament.

Movements.

The *active* movements of the joint are flexion and extension. The *passive* movements are: (1) a lateral hinge movement corresponding to adduction and abduction of the other digits; (2) a gliding movement in the horizontal plane, the base of the phalanx being displaced towards the palm of the hand. A similar gliding movement of phalanx on metacarpal can be produced in the fingers, but it is of less extent. With very long lax ligaments hyperextension and some degree of subluxation may take place normally as a result of active movements without apparent injury to the joint.

The accompanying skiagrams may be considered typical of (*a*) the normal, and (*b*) the subluxation in boxer's thumb. The subject of this particular joint had had a complete dorsal dislocation, and subluxation resulted. Note particularly a dislocation of the phalanx in the horizontal plane towards the palm, and the wide gap between the sesamoids and the head of the metacarpal.

Symptoms.

Immediately after the injury the patient complains of pain in the joint and of weakness, particularly as regards grip. There is not usually much swelling at the time. If left untreated, weakness continues and is accompanied by limitation of movement, both active and passive. In old-established cases the joint is almost immobile. It assumes a position of semiflexion, and becomes somewhat fusiform in shape from thickening of the capsular structures. The swelling tends to be more abrupt than in rheumatoid arthritis.

Treatment.

Digital reposition of the bones is easily accomplished by manipulation in the horizontal plane, with or without traction in the long axis of the thumb. A correct position is, however, not generally maintained. The problem, therefore, is not so much to reduce a dislocation as to make this reduction permanently effective.

Dislocation does not occur unless both the lateral ligaments and the capsule of the joint have been ruptured. The posterior ligament is relatively inefficient compared with the lateral and anterior ligaments. I have confirmed this by numerous experiments on the cadaver. A complete dislocation, in which the joint capsule and ligaments are ruptured, involves also a tearing of the attachments of the sesamoids to the metacarpal head. But in no case was there intervention of fibrocartilaginous or other tissue between the articular surfaces or between the tendons and the metacarpal, although I had imagined at one time that such intervention was a possible cause of failure in maintaining reduction.

Recurring or persisting deformity is caused by the unopposed traction of the short muscles of the thumb in the presence of rupture of the lateral ligaments and capsule. Treatment must therefore be directed to neutralizing this muscular pull. The first essential is a dorsal reduction of the lower end of the phalanx whereby it is brought into correct anatomical alignment, while maintaining a certain degree of flexion of the joint. This semiflexed position is best maintained by a special splint which exerts backward

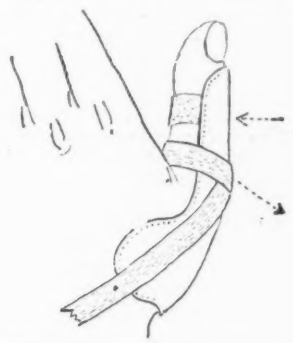

FIG. 3.—Illustration of the splint.

pressure on the lower end of the phalanx and the tendons, and counter-pressure both on the distal end of the phalanx and on the metacarpal. The moulded metal splint illustrated was made for me by Messrs. Lindsey and Sons of Brighton. It should be worn for about fourteen days to allow the healing of the capsule and ligaments; massage and passive movements should then be instituted, and the splint kept on for another week or fortnight.

Note.—I have tried both moulded poroplastic and strapping, but these methods have not proved satisfactory in my experience. Poroplastic does not lend itself to fine adjustments; and the essential counter-pressure producing a certain amount of flexion is not obtained by strapping.

OSTEITIS FIBROSA WITH INITIAL SYMPTOMS RESEMBLING RHEUMATIC INFECTION.

REPORT OF CASE.

BY

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(*With Special Plate.*)

THE cases of generalized osteitis fibrosa described by Wilder,[1] Hunter,[2] and others in 1929 presented signs of progressive weakness, loss of muscle tone, anaemia, pain in the bones, and decalcification of the skeleton, which were attributable to hyperfunction of a parathyroid tumour. The following case has been considered worthy of record since it conforms in many respects to those previously noted, and because it was one in which an initial clinical picture, suggestive of subacute rheumatism, was suddenly altered by the occurrence of a pathological fracture.

In May, 1929, the patient, an unmarried woman aged 50, complained of pain over the posterior aspect of the neck, the left deltoid region, and the left upper arm. Tenderness over those regions was then considered to be due to fibrositis. Anorexia, dyspnoea, mild pyrexia, and pain in the left infra-axillary region

developed in June, when the patient had to be confined to bed. Although the pain in the arm and chest was persistent, her general condition improved with rest, and she was eventually able to carry out her household duties to a limited extent. In August, however, while stepping on to a vehicle, she experienced a sudden severe pain in the left upper arm with a sense of "something having snapped." Examination immediately after this incident revealed subcutaneous haemorrhage along the inner aspect of the left upper arm and immobility of the affected part. A fortnight later the patient was admitted to a nursing home. A hard, fusiform swelling about the size of a tangerine orange was present over the lower third of the left humerus. Crepitus and undue mobility were absent. Tenderness was slight, but movements around the left elbow-joint were painful and limited. Sensations were unimpaired.

Radiograms showed a complete oblique fracture at the lower end of the left humerus, with the fragments in fairly good position and callus formation. The hard bone in the region of the fracture was greatly rarefied. The appearances were definitely indicative of pathological fracture (see Fig. 1). This finding was supported by the history of the case, in which there had been no question of external violence. Other areas of rarefaction were present in both epicondyles, in the head of the radius, and in the olecranon on the left side, while the right humerus, radius, and ulna (see Figs. 1 and 2), and the ribs on both sides, were also involved. Although the evidence pointed to the fracture having been pathological rather than traumatic in origin, healing had not been delayed, since bony union was firm. The differential diagnosis between secondary carcinoma of bone and some form of rarefying osteitis then fell to be considered.

A small nodule, about the size of a haricot bean, was palpable in the left mamma. The patient was examined by Mr. G. T. Mowat of the Glasgow Royal Cancer Hospital, who expressed the opinion that the nodule was more likely to be associated with chronic mastitis than with carcinoma. It was subsequently removed by Mr. Mowat. Histological examination revealed dense patches of fibrous tissue with very scanty adenomatous elements, indicative of chronic mastitis. It was pronounced non-malignant.

Examination of the pelvis, the chest, and the abdomen gave no evidence of neoplasm. Gastric analysis, after an Ewald's test breakfast, showed a normal acidity. The blood picture was that of a secondary anaemia. The urine contained a trace of albumin. Mitral stenosis was the only other point of note in the general survey.

The above findings, taken in conjunction with the fact that the fracture was well healed, were considered sufficient to exclude the presence of a primary carcinoma in any of the regions from which metastases to bone usually originate, and to confirm the non-malignant nature of the disease in the bones. Furthermore, the patient's nutrition was improving on ordinary diet.

The weight of evidence, then, turned in favour of some form of rarefying osteitis. A metabolic experiment, in which the calcium intake and output were measured over a period of four days, showed, however, that there was no excessive decalcification. The retention of calcium was slightly positive (0.3 gram CaO per day), and the calcium content of the blood was normal (0.014 per cent. CaO).

After returning home, on October 22nd, pain became more generalized, and the patient was completely confined to bed. Mild pyrexia, dyspnoea, and cough with blood-stained sputum commenced in December, following upon a chill. Anorexia and vomiting, not preceded by nausea and unassociated with food, supervened; oedema of the legs developed, and the patient died in January, 1930, with all the signs of cardiac failure.

Although the features of the case at one stage suggested that the pathological fracture might be associated with tumour of bone, the subsequent history as well as the clinical findings indicated that it was due to a localized or arrested osteitis fibrosa.

REFERENCES.

[1] Wilder, R. M.: *Endocrinology*, 1929, xiii, 321.
[2] Hunter, D.: *Proc. Roy. Soc. Med.*, 1929, xxiii, 2, 227.

ARTERIAL PRESSURE IN ITS CLINICAL ASPECTS.*

BY

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In 1628, close upon 302 years ago, William Harvey published his observations on the circulation of the blood. The fundamental characters of his immortal discovery are still acknowledged to be in the main identical with those that he portrayed, without which no study of blood pressure would have been possible.

Meaning of Blood Pressure.—A certain level of blood pressure is essential for every individual in order that the circulation may be maintained. It is only when this level is too high or too low that symptoms are apt to arise. In physics blood pressure may be defined as that pressure exerted by the blood at a given instant upon a given point in the circulatory system. In physiology the term includes not only arterial, capillary, and venous pressures, but also the pressure of the blood upon the interior of the heart itself. In everyday language, however, the term is employed solely to designate arterial pressure. In its clinical aspects arterial pressure represents "a force originated by the contractions of the heart, maintained by the reaction to distension of the arterial walls, and regulated by the degree of resistance in the terminal portion of the arterial system." (Gallavardin.)

Types of Sphygmomanometer.—Modern instruments used in the clinical estimation of arterial pressure are of two main types—mercurial and aneroid. The mercurial sphygmomanometer registers the height in millimetres of a column of mercury equivalent to the arterial pressure at the moment of investigation. The aneroid instrument possesses an expansile chamber, distension of which by increase of internal pressure is magnified, and in turn transmitted to a fine needle travelling round a dial. Personally I find no instrument so generally satisfactory as an accurately constructed mercurial manometer of modern type, such as the baumanometer. Many practitioners prefer instruments of aneroid type owing to their smaller compass and greater portability. All aneroids, however, should be calibrated annually against a standard mercurial manometer, since after frequent use the aneroid chamber is liable to undergo over-distension, and thus to give readings which are too low in high pressure cases.

CLINICAL ESTIMATION OF ARTERIAL PRESSURE.

For the majority of cases the auditory method of estimation is the simplest, quickest, and most generally applicable. It is performed as follows: The patient, seated in a comfortable position, allows the bared arm to lie with the muscles relaxed upon a convenient support of such height that the armlet is approximately at the level of the heart. For patients confined to bed the instrument may be placed on a small adjoining table. The armlet should be evenly wrapped round the arm from within outward like a bandage, the tail being tucked in beneath the last fold. It should be applied as high as possible, so that the lower margin is well above the bend of the elbow, the middle of the pressure bag lying over the inner side of the arm, thus ensuring effective compression of the brachial artery. The patient's attention should be distracted by noting the rate and characters of the radial pulse. Apprehensiveness on the part of a sensitive patient should be allayed by explaining that the band round the arm will tighten for a minute or so, but that this temporary pressure is quite harmless. The pressure bag should be rapidly inflated until the pressure within it is above that in the brachial artery, over which the bell of a stethoscope has been lightly placed just above the bend of the elbow, to the inner side of the biceps tendon.

On decompression following pulse obliteration the first audible click denotes the level of the systolic pressure. As the external pressure in the bag is permitted gently and evenly to fall a variable murmur phase becomes audible, passing into a longer sequence of sonorous thuds, which gradually reach a climax of intensity before being succeeded by a series of dull and muffled sounds, the fourth auditory phase, preceding silence. The first dull sound following the last loud thud denotes the level of the diastolic pressure. By subtracting the diastolic pressure from the systolic one obtains the differential (so-called pulse) pressure. These figures, along with the pulse rate and characters, can readily be entered in the case notes, and constitute "the complete arterial pressure picture."

* An address given to the Kensington Division of the British Medical Association on March 19th, 1930.

Importance of the Diastolic Pressure.—Of the two ends of the pressure scale the diastolic[1] is by far the more important, in that it is a measure of the burden which the arterial walls and aortic valves must continually bear, while the systolic represents only an intermittent and superadded load. Further, the diastolic pressure constitutes a valuable measure both of peripheral resistance and of eliminatory capacity. The differential (pulse) pressure, obtained by subtracting the diastolic from the systolic, represents the cardiac load, and is almost a constant in health between the ages of 20 and 50.

Physiological Factors in Arterial Pressure.

Numerous physiological factors cause considerable fluctuations in systolic arterial pressure, the diastolic being much less influenced. The chief factors that bring about increase in pressure are body weight and, to a less extent, height; psychical stimuli; restless sleep and nightmares; food and alcohol, the rise being soon succeeded by a fall; tobacco in those unaccustomed to its use; muscular work; mental exertion; puberty; and the menopause. The factors which cause a fall are rest and quiet sleep; fatigue and fasting; menstruation and pregnancy cause variable effects.

Menstruation.—During the week preceding menstruation both pressures rise. With the onset of flow they fall rapidly, to reach their lowest levels at the end of the period. during the next fortnight of the intermenstrual cycle arterial pressures gradually return to the previous standard levels.

Pregnancy.—As yet there is no absolute agreement as to the levels of arterial pressure in pregnancy. Most of the figures given in the literature are too high. In primiparae below 30 years of age one does not, as a rule, expect to find a systolic pressure greater than 95 to 115 mm. of mercury, nor a diastolic respectively greater than 50 to 75. In multiparae the pressure tends to range slightly higher, being probably influenced by age. During the latter end of pregnancy there may be a gradual and slight rise. Nevertheless 60 per cent. of all cases are below a maximum of 125 mm. Another 25 per cent. with systolic pressures varying between 125 and 140 may be regarded as potentially toxic, and require more careful watching than is usually given. The remaining 15 per cent. with systolic pressure above 140 and diastolic correspondingly elevated may be regarded for the most part as definitely toxic. In such cases albuminuria and occasional casts are frequently met with. If the pressure still goes on rising the patient's life becomes endangered and premature termination of pregnancy may be necessitated.

Climacteric.—About the climacteric epoch a benign form of hyperpiesia may occur, most frequently in multiparae inclined to obesity and constipation, the condition being aggravated by worry and anxiety. Faulty endocrine balance in the directions of ovarian insufficiency and adrenal hyperactivity almost certainly plays a large part in causation.

Clinical Investigation.

Supposing one has in the consulting room a patient in whom some abnormality of arterial pressure is suspected, what is the best procedure to adopt? On accurate diagnosis correct prognosis and control alike depend. Hence it is well to begin with a detailed inquiry into the personal and family history. Systematic investigation of the cardio-vascular system follows, first estimating arterial pressure and pulse rate, and then noting the condition of the superficial arteries, the position and character of the apex beat, the size of the heart and of the great vessels at its base by careful percussion, together with the quality of the cardiac sounds. Inspection for the possible presence of oedema, examination of the fundi with the ophthalmoscope, and urinary and blood tests complete the special investigation.

Symptoms of High and Low Arterial Pressure.

Uncomplicated high arterial pressure is usually unaccompanied by symptoms. Only in later stages in the presence of associated conditions does the patient begin to complain. Even arterio-sclerosis is not a necessary concomitant of high pressure, for about half the total number of cases exhibit standard or even low pressures. In the absence of conditions of association the subject even of a high grade of pressure may feel quite well. Indeed, a dramatic feature of hyperpiesis, to which I have drawn attention, is the feeling of comfort and well-being on the part of those about to succumb to cerebral haemorrhage. If a patient with a perilously high pressure expresses himself as feeling particularly fit, then is the time to beware of sudden and desperate events. Subjective sensations may be met with in the course of high pressure in the following order of frequency: fullness, heaviness, pressure feelings or throbbing in the head, often aggravated by mental effort; dizziness on exertion; palpitation or precordial pain amounting at times to angina; dyspnoea on exertion; drowsiness and disinclination for effort; impaired memory and concentration; irritability; insomnia; anxiety states; gradual failure of vision or sudden one-sided blindness; neuralgia; migraine; epistaxis; uraemic symptoms.

One striking fact, which I emphasized last year, is that the majority of these symptoms are identical with those found in cases of low arterial pressure, but arise from opposite circulatory causes of excess on the one hand and defect on the other.[2] Dizziness in hyperpiesis results from cerebral congestion; in the low pressure case it is postural and readily induced by sudden change from recumbency to the vertical position. Again the feeling of well-being may precede cardiac failure. A notable example is afforded in the death, on March 16th, of General Primo de Rivera, the ex-Dictator of Spain. As reported in the daily press, at 9 a.m. his two daughters and his son saw him sitting up in bed dealing with his correspondence. He told them that he had had a good night's rest and had never felt so well. One hour later he died of cardiac failure consequent upon influenza.

The high pressure individual is often the subject of excess metabolism and labours under the strain of acid retention with inability adequately to eliminate waste products; the low pressure individual usually suffers from faulty assimilation, the acid-base balance of the tissues being deviated to the alkaline side, and tissue destruction preponderating over repair. Now that by biochemical methods we are enabled to gain a much closer approximation to exact ideas as to how errors of metabolism may be corrected and faulty balance redressed, we can formulate measures of control with far greater certainty. It is only from a broad biological standpoint which takes cognizance of early departures from that delicate adjustment of vital functions that we term "health" that the difficult problems of both high and low pressures can be rationalized and brought under one comprehensive law, to which I have referred both of these states as opposite expressions of failure to environment in its widest application.[3]

Diagnosis.

Differentiation of Types of High Arterial Pressure.

The most direct way of attacking the problem is to regard hyperpiesis as including *all* types of raised arterial pressure, whether physiological or pathological, temporary or permanent, renal or non-renal. For the sake of simplicity one now takes out of the general group the syndrome to which the late Sir Clifford Allbutt gave the name of hyperpiesia. This malady is of considerable interest and importance in that it possesses individual features. Becoming manifest between the ages of 40 and 60, heightened arterial pressures of 160 mm. or more systolic and 100 mm. or more diastolic appear as constant phenomena in conjunction with left ventricular hypertrophy and changes in the walls of the arteries recognizable at necropsy as a diffuse hyperplastic sclerosis (G. Evans), but distinguishable on the one hand from renal sclerosis and on the other hand from senile atheroma. From renal sclerosis hyperpiesia is differentiated by its occurrence in robust and often plethoric subjects, who for years may experience no disability; from senile atheroma, by the existence of the high pressure. Blood urea is generally within normal limits, and the urine shows at most only traces of albumin. A heart weight of 15 oz. or so is

a common post-mortem finding. Cerebral haemorrhage or cardiac defeat are the most frequent terminal events; uraemia is uncommon.

Conditions of Association.

The only effective way of studying pure hyperpiesis is to watch its manifestations in early life before degenerative processes have set in. In children and adolescents, as well as in later life, there is one association that is not degenerative. This is arterial hypertonia, which is capable of inducing either a temporary angiospasm or, when true hypertrophy of arterial muscle has developed, a permanent hyperpiesis. The real degenerative changes of association are cardio-arterio-sclerosis and nephro-sclerosis.

Tests of Renal Efficiency.

In hyperpiesis the situation is controlled by the state of functional efficiency of the kidneys. For those patients whose kidney function is unimpaired one can do much; for those in whom the renal secreting substance is already gravely damaged one can do little.

Blood Tests.—The term "nephritis" in connexion with raised arterial pressure is universally taken to mean interstitial or azotaemic nephritis (chronic Bright's disease), and the order in which the non-protein constituents of the blood are affected is as follows. In the earliest stages there may be a rise of the blood uric acid above the normal 4 mg. per cent. without the other fractions being affected. The blood urea nitrogen, which in private patients does not exceed 15 mg., and in hospital patients 20 mg. per cent., is next acted upon and may rise well above 100 mg. per cent. It is, however, accepted that a figure for blood urea nitrogen of above 100 mg. per cent. persisting over a lengthy period of time denotes a prognosis of almost certain fatality within twelve months. Creatinine nitrogen is the last to be affected, as it is so easily eliminated; its normal figure is 1 to 2 mg. per cent., and a rise of over 3.5 mg. per cent. almost invariably indicates a hopeless prognosis. With regard to the alkaline reserve, this as a rule is only affected during late stages. The most common cause for a notable diminution of the CO_2 combining power of plasma (normally not below 55 c.cm. per cent.) in nephritis is an inability on the part of the kidney to excrete acid phosphates, with a consequent rise in the blood phosphorus figure (the normal inorganic phosphorus in the plasma is 4 mg. per cent.). This interferes with the buffering power of the blood, and the alkaline reserve may fall to 30 c.cm. per cent., or even lower.

Urine Tests.—Where blood examination is difficult or impracticable, MacLean's urea concentration test can be performed. It involves the taking of 15 grams of urea in 100 c.cm. of water, and the analysis of specimens passed at half-hourly intervals for urea, the concentration of which should be well above 2 grams per cent., which indicates that the kidney efficiency is uninjured.

ETIOLOGY.

Hyperpiesis is probably due to a variety of causes. Hereditary and familial influences undoubtedly play a part, as also do protective and mechanical factors. Many cases arise as the result of long-continued anxiety states, or of emotional shocks, which through endocrine-sympathetic influences send up arterial pressure and induce angiospasm. This hypertonia of the vessel walls, at first transitory, may pass into a state of permanent contraction, and finally end in true thickening of the muscular coats. In many cases a still further explanation is required, which in my judgement is often afforded by toxaemia, either induced by bacterial toxins or by intoxications of endogenous or exogenous nature. It is probable that such toxaemias do not become operative in raising arterial pressure unless some basic disturbance of metabolism is present.

PROGNOSIS.

Uncomplicated hyperpiesis is much more amenable to control than when associated conditions of degeneration, especially of the kidney, have supervened. Endocrine-sympathetic cases, inducing angiospasm in high pressure states and hypotonia in low pressure states, can often be favourably influenced. In pressures of moderate grade a fair prognosis may be given, as at the menopause, especially in patients with endogenous obesity. Cardio-vascular defects demand a more guarded opinion. In cases of permanently raised pressure the onset of commencing heart failure is of the gravest import. The signs of this are a drop in pressure with dyspnoea, cyanosis, premature contractions either single or grouped, gallop rhythm, total arrhythmia, and continuous acceleration of the pulse rate. Any combination of these signs points to cardiac defeat. A diastolic pressure continuously of 120 mm. or more frequently indicates renal involvement, and if maintained at 135 mm. or higher implies a grave outlook.

CONTROL.

I prefer to speak of control rather than of treatment, since it is not in every case that treatment is required. To attempt by indiscriminate use of vaso-dilator drugs, such as the nitrites, immediately to lower a heightened pressure in the absence of indications of the cause is likely to be productive of considerable harm to the patient. Such harm may, indeed, be irreparable, so that it is wise to keep these powerful drugs only for emergencies. High arterial pressure resembles fever in that both are symptomatic of processes of reaction and defence against underlying disorder or disease. Unless either of these symptoms becomes so high as to threaten life, irrespective of the cause, it is illogical and futile to anticipate more than temporary reduction by a direct attack. A warning should also be given against too vigorous treatment by fasting or purgation. Each individual has an optimum pressure at which he or she feels most comfortable, often below standard levels in low pressure states, and above these levels in high pressure states, more especially when a fairly high head of pressure has to be maintained in order that the kidney may continue to secrete and excrete.

Although drastic attempts at reduction are to be deprecated, the opposite view that nothing can be done to relieve high pressures is equally erroneous. Having realized that the most potent causes of this condition are toxaemia, worry, and excess, first proceed to eliminate any that are obvious by a careful search for diseased tonsils, septic gums and teeth, infections of the gall-bladder, appendix, and prostate, and appropriate treatment directed to these and other like causes of focal sepsis. Intestinal stasis, with absorption into the circulation of toxins from this source, is a potent cause of both high and low pressures; hence directions should be given as to regular daily evacuation of the bowels to avoid straining.

Anxiety states should be dealt with by inculcating principles of self-control. For certain cases rest in bed at the outset may be necessary; for others it is inadvisable. Efforts should be directed to making environment less irksome and more harmonious. An occupation of steady routine is beneficial, and should be preferred to one of constant anxieties and sudden hazards. A sufficiency of rest should be enjoined. In general a minimum of eight hours should be spent in bed, and this time should be devoted as far as possible to quiet sleep. Enough relaxation and holidays should be taken in quiet, sunny, and congenial surroundings. Excesses and over-indulgence of all kinds should be checked.

Diet.—More people are killed by overeating than by over-drinking. Hence the pleasures of the table should be enjoyed in strict moderation. Meals should be varied in kind and balanced, with the inclusion of a sufficiency of vitamins in the form of fresh fruit, vegetables, milk, cream, and butter. Excess of fat is inadvisable, though olive oil may be taken well mixed with fresh salads. Similarly with carbohydrates, excess producing flatulence and digestive upsets, and tending to augment arterial pressure by causing obesity. Meat, including fish, should be taken only at one meal, and the quantity should be limited to the minimum metabolic needs of the body. When the kidneys are injured, a lacto-vegetarian diet becomes essential, since butcher's meat, spiced and seasoned dishes, and meat soups are harmful where there is difficulty in eliminating waste

nitrogenous products. In general, boiled meats, chicken, and fish are preferable to roast joints. Eggs are usually admissible, but a light breakfast of wholemeal bread and butter, or toast and marmalade, followed by fresh fruit, is better than heavy dishes of fish, or bacon, sausages, and eggs. Table salt should be avoided when renal, cardiac, or cerebral complications are present, a non-pressor table salt being substituted, if craving is felt, consisting of ammonium hippurate 1 part, potassium nitrate 4 parts, potassium chloride 25 parts.

Drinks.—Water is the best, and should be taken on an empty stomach an hour before meals and at bedtime. Where the water is hard, as in London, it may with advantage be softened by a permutit or other water-softening plant. Pure English table waters are Stretton, Malvern, Braceborough, and still salutaris, which latter is distilled water passed over forest burnt wood charcoal to render it palatable. Of the French mineralized waters, Evian, Vittel, and Contrexéville enjoy a deserved reputation in flushing out the kidneys. One pint of water for each five stones of body weight, imbibed during twenty-four hours, is a good working rule. Other drinks should be taken sparingly; China tea or tea freshly made with milk is to be preferred to Indian blends; H.A.G. caffeine-free coffee may replace the ordinary coffee. Alcohol is best not taken at all.

General Habits.—Tobacco is best avoided. Cigar smokers are more prone to arterio-sclerosis than pipe or cigarette smokers. Exercise should be well within the limits of fatigue, and elderly people should not vie with their juniors in tests of endurance. Motoring, but not at great speeds, suits most, but not all. Golf should be preferred to tennis for those in whom age changes have begun to be manifest. Finally, the keynote of avoidance as well as of control of arterial pressure may be summed up in the four words of advice—moderation in all things.

Special Modes of Treatment.

Deep breathing exercises, relaxation, and passive movements, resistance exercises, and massage have their appropriate uses. General massage combined with Swedish movements is a most useful therapeutic adjunct in lowering raised arterial pressure. *X* rays, high-frequency, and diathermic currents in experienced hands yield good results. Some subjects benefit from ultra-violet radiation, which balances opposite abnormalities of arterial pressure. In emergencies, such as threatened or actual apoplexy, lumbar puncture is of timely aid, as well as in warding off or relieving uraemic convulsions or severe congestive headache. Venesection up to 500 c.cm., followed by fasting for a couple of days, gives relief to an embarrassed circulation, particularly in the presence of venous stasis.

Drug Therapy.

For the toxaemia resulting from intestinal stasis rectal injections every morning for three weeks of a pint of solution of potassium permanganate, 1 grain in water, after the method advocated by Dr. Nott, is often of great value, any constipation being at the same time corrected by tablets of lactobyl or taxol. Calomel at night, twice weekly, in 2-grain doses, with a teaspoonful of equal parts of sodium and potassium sulphate on the morning following, is useful in thinning the bile, and by inducing a greater flow lessens intestinal putrefaction. Though it is impossible to disinfect the intestinal tract, monsol tablets or T.C.P. emulsion are at times serviceable in lessening toxic products of fermentation and putrefaction.

In the lesser grades of hyperpiesis 2-drachm doses of potassium chloride thrice daily in a tumblerful of water give encouraging results. For the cardiac types, theominal, a combination of luminal with theobromine, promotes diuresis and lowers arterial pressure. Iodides I have found of little use, greater effect being obtained from oral administration of the French tincture of iodine, 5 minims in water or milk after meals, with gradual increase of dosage, or by hypodermic injection of an iodine compound such as tiodine. In all cases of cardiac decompensation there is no drug to compare with the time-honoured digitalis in standardized preparations.

More recent remedies are: (1) liver extract, which often induces considerable lessening in the height of pressure and affords relief of symptoms in the majority of cases, those without arterio-sclerosis offering the best prognosis. Lilly's heparmone contains a histamine-like substance, and is one of the best preparations for intramuscular injection up to 5 c.cm.; (2) sodium sulphocyanate, also where organic changes in the arteries are absent, is useful in 3-grain tablets by the mouth; (3) choline derivatives, such as pacyl, may be given in tablet form, or acecoline (acetylcholine hydrochloride) parenterally; (4) animasa, an extract of the muscular coats of arteries of young animals, has been found of benefit in sclerotic cases when long continued; (5) anabolin has given me no results which are appreciable.

I have left treatment by baths and waters till last, since these demand still further study. Effervescent carbonic acid baths exert on arterial pressure reduction or increase, depending upon the pre-existing state. They can be obtained either naturally aerated or artificially prepared at many spas, notably at Royat, Spa, and Nauheim. Manipulation baths and douches are beneficial in high pressure cases, and in those of low pressure associated with circulatory stasis.

REFERENCES.

[1] Halls Dally: *High Blood Pressure*, second edition, 1926 (William Heinemann), pp. 50, 55, 103.
[2] Idem: *West London Med. Journ.*, October, 1929, xxxiv, No. 4, p. 185.
[3] Idem: *Low Blood Pressure*, 1928 (William Heinemann), pp. 39, 68.

CEREBRAL ABSCESS FOLLOWING TONSILLAR INFECTION.

BY

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THE occurrence of cerebral abscess as a direct sequel of tonsillar infection is rare, and deserves record. In the *British Medical Journal* of June 29th, 1929 (p. 1158), Housden describes a case of cerebral abscess following acute tonsillitis, and points out that there is little or no reference to such an association in the literature.

I am indebted to Dr. Francis Roberts and to Dr. T. Pearse for some of the following notes.

A boy, aged 7 years, suddenly became ill one afternoon with a temperature of 101.4°, and was found to be suffering from severe acute tonsillitis. In addition, he had old mitral disease of rheumatic origin. He was kept in bed, and his temperature fell to normal in eight days, but in view of the cardiac condition he remained in bed for a further three weeks.

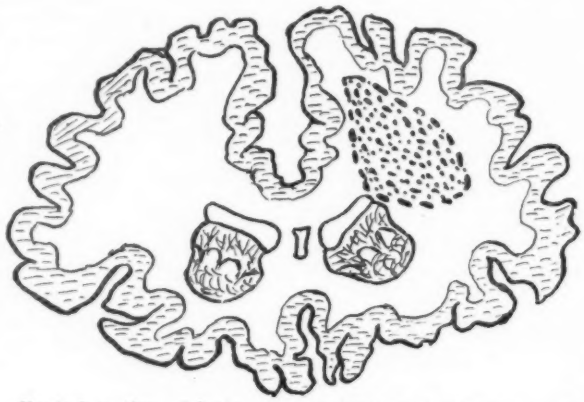
Five and a half weeks from the onset of his attack of tonsillitis the tonsils and adenoids were removed. Following this his convalescence took a normal course for five days. He then suddenly developed a sharp rise in temperature accompanied by a rigor. His chest was carefully examined at this time, but no trace of broncho-pneumonia was detected. He rapidly became seriously ill; vomiting was not a marked feature. On the day following the rigor weakness was noticed in the lower part of the left side of his face; on the following day some weakness in the left arm appeared, and shortly afterwards slight weakness in the left foot. On the fifth day after the rigor this had developed into a complete left-sided hemiplegia. On the seventh day he was definitely drowsy; his temperature was 101°, and the discs were reddened and congested. On this day he was admitted to hospital.

On admission the boy was in a drowsy, almost stuporous, state. The temperature was 98.2°, the pulse 68, and the respirations 32. He could, however, be roused, and no sensory or motor aphasia was present. There was a left-sided hemiplegia, paralysis of the face and arm being more marked than that of the leg. The tendon reflexes were brisk on the right side and very much subdued on the left. The abdominal reflexes were equal and present; the plantar reflexes were marked extensor on the right and faint on the left. Kernig's sign was not definite, but the neck seemed slightly rigid. There was no vomiting. The pupils reacted to light and to accommodation; there was no nystagmus, and no oculomotor paresis. The other cranial nerves were normal. Mr. Bernard Chavasse reported that both discs were blurred and red, with some swelling in their lower halves. A coarse systolic murmur was heard at the apex of the heart. On examination of

the lungs nothing abnormal beyond signs of some congestion at the bases could be discovered. The cervical glands on the left side were enlarged.

A lumbar puncture was performed. The cerebro-spinal fluid showed a slight increase in globulin and total protein; the sugar reduction was diminished, the chlorides were normal, and the cell count 18 per c.mm., the lymphocytes and polymorphonuclears being in equal proportions. No micro-organisms were seen and the culture was sterile. Blood was also taken for culture, but only staphylococci, which were considered to be due to a contamination, were found.

The gradual "march symptoms" of a hemiplegia formed a definite indication of a cerebral abscess in this case. The boy's condition was extremely grave on admission, and in addition he had valvular disease of the heart. However, the localization of the abscess being adequate, it was decided that the chance of operation should be given, but unfortunately he did not survive.



Vertical section of brain, showing location of abscess in subcortical region of right frontal lobe.

There are two theories of the production of cerebral abscess after tonsillectomy. One is that infected pulmonary emboli result from the sepsis in the tonsillar bed; the other, that septic material is inhaled while the patient is under the anaesthetic, and that the cerebral abscess is secondary to one or other of these conditions. The present case—in which early broncho-pneumonia was demonstrated at the necropsy—would appear to fall into the group of the latter theory. The possibility of cerebral abscess, though rarely associated with tonsillar infection, is not to be ignored.

A post-mortem examination was performed by Dr. R. T. Chadwick, who reported as follows.

The brain dura mater was dark in colour and congested. The arachnoid and pia mater were intensely congested and opaque; the blood in the vessels was fluid. No signs of emboli and no pus were discovered. The convolutions on the right side were flattened and the ventricles were filled with clear cerebro-spinal fluid, the left being normal in size, the right flattened by the abscess.

The abscess, which was filled with greenish-red, thick pneumococcal pus, was 2½ inches in diameter and circular in shape; it was situated posteriorly to the fissure of Rolando, extending downwards from the vertex about 1½ inches on the external surface, and the same distance on the internal surface of the right hemisphere, lying about 1/8 inch deep to the brain surface. On the vertex the meninges were intensely congested, and the abscess showed signs of pointing. The medulla was congested, and there were no pressure marks. No sign of tuberculosis or post-basic meningitis was detected, but the brain substance was intensely congested generally.

The tonsillar fossae were found to be healing after the operation, and no sloughs were present. The cervical glands were slightly enlarged, but there were no abscesses therein. The lungs showed an early and moderately intense broncho-pneumonia; the air passages were intensely inflamed. There was great right-sided dilatation of the heart, the mitral orifice admitting two fingers. Old endocarditis was present on the mitral cusps, but the tricuspid and aortic valves were healthy. There was general congestion of the alimentary system, and the mesenteric glands showed evidence of past healed tuberculosis. The kidneys were greatly congested.

ORBITAL CELLULITIS IN CHILDREN.*

BY

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SINCE orbital cellulitis may occur in children of a few weeks old there is no age limit. The essential feature is proptosis of the eye associated with signs of inflammation. Proptosis alone is not sufficient for its diagnosis. Proptosis unassociated with inflammation may be caused by a cyst, a mucocele, a new growth, or what not. Until one meets the combination of a congested eye and pink swollen lids with proptosis the diagnosis cannot be established. Once made, a grave prognosis should be given and the help of the specialist sought.

The diagnosis is not, however, always easy, as it is at times very difficult to be sure whether or not proptosis is present when chemosis of the conjunctiva and a swollen lid are the most prominent features. But it is on the existence of this sign that the diagnosis will depend. Proptosis is mechanically produced by congestion of, or exudation into, the orbital tissues behind the orbital fascia. This is a dense and well-fitting septum separating the orbit proper from the conjunctival sac and the anterior segment and interior of the eyeball. It matters not how severely infected an eye may be, orbital cellulitis, with its cardinal symptom of proptosis, will not arise unless the orbital fascia is penetrated.

It is clear, then, that orbital cellulitis must not be diagnosed because oedema of the eyelid is present, or even cellulitis of the eyelid. The latter is often due to the spread of infection from a hordeolum or impetiginous sore in the neighbourhood; and oedema can often be traced to a cellulitis of the scalp or face, or dacryocystitis, and is then present merely by extension, owing to the loose cellular structure of the lids.

Again, an intense purulent conjunctivitis, gonorrhoeal or diphtheritic, may occasionally give rise to a pink and swollen lid; ocular diphtheria is frequently at first monocular. The diagnosis will be established by the presence of a profuse discharge or of a membrane on the everted lids. For the determination of the presence or absence of proptosis lid retractors are essential. These may be improvised by the use of two hairpins bent over near the blunt end. If a local cause has been discovered for the swollen lid, whether abscess, conjunctivitis, dacryocystitis, or foreign body, it will be treated on appropriate lines. If none such is found and proptosis is present or strongly suspected, a grave view must be taken of the case, as it is one of orbital cellulitis.

Orbital cellulitis in children has, so far as my experience goes, three chief causes:

1. Skin infections, such as impetigo, hordeolum, fly-bite, boils, or any facial wound, with accidentally superadded virulent infection. This is more likely to be met with in older children. The temperature is generally very high; septic cavernous sinus thrombosis and general septicaemia with pneumonia are likely to supervene, and they often end fatally and rapidly. The infection passes by the angular vein to the cavernous sinus. Fortunately such cases are rare.

2. Nasal sinus infection, the commonest cause, is met with in young infants as well as in older children. The temperature is not usually very high and the child is not very ill. The eye is pushed outwards as well as forwards. This is a strong diagnostic point. I will go so far as to say that if the eye is not displaced outwards the case is not nasal in origin. In these cases the services of the rhinologist should be sought; he will, if he thinks necessary, open up the antrum or ethmoidal cells. I believe the most usual condition is an ethmoiditis. If the proptosis is only due to oedema it will gradually subside. If, however, pus has formed in the orbit a counter-opening between the nose and eye may be needed. Convalescence is slow but sure, and the eye is not usually in jeopardy. I have seen a considerable number of cases of this type of cellulitis in the last fifteen years. They are sometimes associated with the exanthemata.

3. Osteomyelitis or periostitis of the orbit is a third principal cause. Until about three years ago I had not seen such a case. I was then asked to attend a young

* An address given to the Paediatric Section of the New South Wales Branch of the British Medical Association on April 11th, 1930.

infant with a high temperature and pink oedema of the eyelids of both eyes, who was very ill. There was no injection of the ocular conjunctiva. As both eyes were affected it was difficult to say whether or not proptosis was present. I believed, however, that it would be by the morrow, and that it was an early case of septic cavernous sinus thrombosis, that nothing could be done, but that my rhinologist colleague should be asked if he concurred. He did concur. On the next day I still found no ocular injection to speak of and no definite proptosis, although the lids were more pink and swollen. I realized then that I had made an erroneous diagnosis, being deceived by the binocular affection, which will generally point to a common origin. I asked that my colleague should see the child again. He found an osteomyelitis of the lower rims of both orbits. Incisions were made over the malar bones, and the child recovered. This was not a typical case, however, as it was binocular—surely a rare occurrence. Furthermore, although there was osteomyelitis of the malar bones, the lesion was anterior to the attachment of the orbital fascia; therefore, though oedema of the lids was present, there was no orbital cellulitis.

I have since seen three cases of orbital cellulitis (monocular) caused by osteomyelitis of the orbit, and not, apparently, associated with or due to sinus infection. I am sure that these cases are metastatic. They have not been coincidental with a similar lesion in the long bones and epiphyses, although they are without doubt analogous. The child becomes very ill indeed, with a high and septic temperature. Pink oedema of the lids and definite proptosis are early signs. The eye is pushed forward without being pushed outwards. Presumably the eye might be pushed to some extent away from the side of origin of the infection, wherever it might be; but, in the early stages at any rate, when the proptosis is merely due to oedema and not to formation of pus, there is no lateral displacement. This is in contradistinction to those of nasal origin. In the last three cases I have seen, the point of maximal swelling and tenseness of tissues has been at the lower outer side of the orbit. Possibly a trauma may have been the exciting cause.

In the first case I was not called in for several days, as a tentative diagnosis of a nasal origin had been made, and the rhinologist had explored the sinuses with an indecisive result and with no improvement in the patient. I found the outer lower orbital margin tense and swollen, and incised it here, getting pus freely. The boy had a high temperature for many weeks, and was very ill. Although there was free evacuation of pus, the orbital oedema and proptosis persisted, and in spite of all efforts the cornea sloughed, and the eye had to be eviscerated. Subsequently he developed a mild osteomyelitis of the facial surface of the malar bone.

The next case was that of an infant, seen in private, with proptosis and similar symptoms. I temporized for a day, and then opened the orbit at the outer angle, evacuating pus. Again the orbital oedema was so great and persistent that the cornea sloughed, and the eye had to be eviscerated, though the child recovered. Sequestra formed for a long time.

The third case was that of a boy of 5, with the same symptoms of high temperature, severe illness, inflammatory central proptosis, and the chief swelling at the lower outer orbital margin. He had been ill two or three days. This time, profiting by my experience, I opened the orbit within half an hour of seeing him, and passed a sinus forceps through the orbital fascia down to the bony floor and rim. No pus was seen, but on the next day it appeared alongside the tube which had been left in. The wound was kept open, the proptosis went steadily down, and the eye was never in danger. He had a septic temperature for several weeks, and had some meningeal symptoms, which, however, subsided on lumbar puncture. *Staphylococcus aureus* was found in the blood and urine, so that there was evidently a very generalized infection. Later he had an attack of osteomyelitis of the tibia.

To recapitulate: apart from cases of orbital cellulitis due to facial infection, in which the orbital condition is only an incident in a fatal septicaemia, there are two main causes. The first, and the most common, is nasal sinus infection, with outward displacement of the proptosed eye and not very severe general illness. Here the rhinologist can give most help; and if he is called in early incision into the orbit will probably be avoided. The second is metastatic osteomyelitis or periostitis of the orbital walls, with severe illness and temperature and central proptosis. The lesson I have learned from these latter cases is that early incision (as in the analogous disease of the long bones and epiphyses) is essential if the eye is to be saved. When once the orbital tissues are thoroughly infiltrated and oedematous it seems to be difficult or impossible to bring about resolution before the cornea has sloughed, owing to interference with its circulation as well as to exposure. Our aim should be to prevent this phlegmonous condition by prompt incision down to the bones involved. Hence the importance of early and accurate diagnosis. In every case of a pink and swollen eyelid the general practitioner should realize the significance of proptosis, if this exists. In its absence he may temporize; in its presence he should act with decision. No case of inflammatory exophthalmos should be regarded lightly.

Although I have dwelt in more detail on the signs and symptoms of the type of orbital cellulitis due to bone infection by the blood stream, that is not because it is the commonest, but because it is the gravest, and demands the most promptitude in its treatment. According to Roemer, more than 60 per cent. of cases are due to nasal sinus infection. He is referring to adults, and I think that this applies much more so to children, owing to the thinness of the orbital walls. In my own practice orbital cellulitis in adults is exceedingly rare, whereas in children it is at least not uncommon.

My aim in this short paper is twofold: (1) to emphasize the importance of proptosis when associated with inflammation; (2) to attempt to make clear the difference in signs and symptoms of the two main types of orbital cellulitis, and the difference in outlook and treatment which each demands.

Memoranda:

MEDICAL, SURGICAL, OBSTETRICAL.

RENAL CYST CONTAINING CALCULI.

(With Special Plate.)

THE following particulars of a renal case upon which I recently operated will, I think, be of general interest.

A man, aged 62, had always had good health until seven years ago, when he noticed a swelling in his left lower abdomen. He consulted a surgeon, who, after examination, advised an operation. After the operation he was told that there had apparently been a cystic condition of his left kidney, the wall of which had been removed, and a drain put down into the cavity. He made a good recovery, and had no trouble until three years ago, when the swelling returned; on this occasion his doctor aspirated and drew off a large quantity of fluid.

A few months ago he came into my hands, and I found a large mass occupying a considerable proportion of the left hypochondriac and lumbar regions of the abdomen. It was dull on percussion, and its range of movement was practically *nil*. *X*-ray examination showed a "corn-cob"-like mass of calculi (see plate).

A cystoscopy having been performed, and a pyelogram taken, the efficiency of the right kidney was proved good. No solution could be made to travel more than an inch up the left ureter, but on the right side there was a normally placed organ. It was then decided to explore him.

Operation.—The old scar on the anterior abdominal wall was removed, and the abdomen was opened as carefully as possible. The sac of the cyst was, however, so adherent to the abdominal wall that it was at first punctured, and a dark grumous-looking fluid escaped. This being controlled, the cyst was slowly separated from adhesions with which it was completely surrounded. This was no easy matter, since it was necessary to avoid as much as possible damaging the numerous vessels of the mesentery which ran across it. Ultimately, however, the whole cyst was shelled out. With the exception of the descending colon, bowel was never seen throughout the whole operation; we had been apparently working in a retroperitoneal position from the first, the slowly enlarging kidney having pushed everything aside in its advance anteriorly. The cavity was drained and the aperture in the mesentery closed. The patient made an uninterrupted recovery.

Pathology.—On the sac being freely opened more than two pints of grumous fluid escaped. The sac was directly continuous with an enormously dilated kidney pelvis; this in turn expanded into wide, deep calyces. The kidney pelvis and calyces contained hundreds

of bright, smooth, copper-coloured calculi, which on examination proved to be composed of pure triple calcium phosphate. The kidney substance itself was practically non-existent, being stretched in a thin layer round the surface at the back of the sac. The left ureter was tightly stretched over the wall of the sac; there were no stones in it.

I am indebted to my colleagues on the honorary surgical staff of the General Hospital, Darlington—Mr. Pridham for an excellent pyelogram, and Mr. Pearson for assisting at the operation.

DAVID R. E. ROBERTS, M.B., M.Ch.,
Honorary Assistant Surgeon, Darlington General Hospital.

TRAUMATIC RUPTURE OF THE SPLEEN.

A CASE of traumatic rupture of the spleen in a girl aged 9 is perhaps sufficiently unusual to be of general interest, particularly since the patient eventually recovered after delayed splenectomy.

The patient, while crossing a railway line, fell on a rail, hitting her abdomen with such force that she was unable to move. She was lifted up and carried home, where she was seen by Dr. Daniel, who sent her into hospital with the provisional diagnosis of a ruptured viscus. She vomited immediately on admission, and three times subsequently, but there was no blood in the vomit, nor was there any haematuria. The bowels were moved, the motion being free from blood. Peristalsis was heard all over the abdomen. The child complained of colicky pain, but could not localize it. The abdomen moved freely, and there was no rigidity; the hepatic and splenic areas were examined, but no evidence of rupture could be found, nor was there any sign of a collection of fluid in the abdomen. The pulse was below 100, and the temperature was normal. She was kept under observation for two days, when a temperature of 100° developed, and she complained of pain and tenderness on pressure over the appendix area.

The abdomen was opened through the right rectus. Free blood was found in the peritoneal cavity, especially in the left hypochondriac region; this was swabbed out, and a ruptured spleen became evident. The pedicle was clamped and the spleen excised. Recovery was uneventful, except that two weeks after the operation the patient developed scarlet fever.

A blood count, seven days after the operation, was as follows: red cells 4,200,000 per c.mm.; white cells 9,700; haemoglobin 75 per cent.; colour index 0.9. The differential count was: polymorphonuclear neutrophil leucocytes 52 per cent., eosinophil cells 1 per cent., basophil cells 0.5 per cent., lymphocytes 43 per cent., and large lymphocytes 3.5 per cent. There was no anisocytosis nor poikilocytosis.

The girl is now in good health.

J. LIVINGSTON, M.D., F.R.C.S.ED.,
Barrow-in-Furness. Honorary Surgeon, North Lonsdale Hospital.

Reports of Societies.

CARBON MONOXIDE POISONING.

AT a meeting of the Medico-Legal Society on June 26th, Lord RIDDELL presiding, a lecture was delivered by Professor J. S. HALDANE, F.R.S., on carbon monoxide poisoning.

Professor Haldane began by remarking that it had been known for a century that CO was a dangerous poison, and that its special danger arose from the fact that it had practically no odour or warning irritant action on the air passages. The first sign of any direct physiological effects of CO was observed when the haemoglobin was about 20 per cent. saturated. This sign was increased shortness of breath on any considerable exertion. When the saturation increased to 30 per cent. there was a slight increase in the pulse rate and the breathing during rest, and such action as running upstairs was followed rapidly by distinct faintness. With higher saturations these symptoms became more and more marked, and with 55 per cent. saturation even a very slight exertion, such as getting up from a chair, might precipitate a fainting attack. Mental deterioration of various kinds was evident in the subject to other observers, though not to the subject himself. If the saturation lasted any considerable time and was fairly high it was followed by headache. In some persons headache occurred with 20 or 25 per cent. saturation. Professor Haldane proceeded to relate observations which he had made on himself in a steel chamber, and which, he said, were limited in certain respects because they could not be pushed quite up to the point of loss of consciousness. When a saturation of 30 or 40 per cent. was reached certain mental symptoms began to appear, and became more and more prominent with increasing volume. One of these symptoms was impaired memory for the most recent happenings. One could, for example, count the pulse, but one would immediately forget at what point the counting began. The pressure in the chamber where the experiments were carried out corresponded to that found at 25,000 feet above sea-level, and he and his companion (a Mount Everest explorer) were unacclimatized. Of one hour of this experiment he had not the slightest memory afterwards, although, according to his companion, who was less affected than himself, he was talking all the time and answering questions. Until the pressure was increased his companion thought that he (Professor Haldane) was not suffering to any degree, but at length he noticed him take up a mirror to look at the colour of his lips and found that he was looking, without being aware of it, at the back of the mirror. Loss of memory by itself made the conduct of men suffering from carbon monoxide poisoning quite irresponsible. He had known it take as many as six men to keep back a miner from returning to his work on an underground fire where he had fallen unconscious just previously through CO poisoning. In the steel chamber experiment his companion told him afterwards that during the period of his own loss of memory he (Professor Haldane) continually asked him to keep the pressure at 320 mm.; although, had he been fully conscious, and realized that he was getting worse, he would not have wished to prolong the experiment. The blanks of memory were often filled in with purely imaginary events. Along with failure of memory went failure of co-ordination of movement. The gait became like that of a drunken man; the handwriting (of which he showed examples) became progressively irregular. Sensory perception of every kind seemed to be dull. Thus, it frequently happened that miners, who were by no means unconscious, received bad burns from lamps which they were carrying, but felt no pain from the burns. He had noticed himself that he tried to grasp at objects which were some distance away under the impression that they were within his reach. When normal conditions were restored everything seemed to get brighter and more distinct, sounds louder and clearer. The deterioration took different forms in different persons. Some people simply became more and more torpid, others became hilarious, and some became extremely ill-mannered, quarrelsome, and dangerous. But whatever the state of the person, he remained quite confident in his own judgement, just as did a drunken man. It was very easy to mistake the effects of carbon monoxide poisoning for those of drunkenness.

In persons who had died from carbon monoxide poisoning the haemoglobin was about 80 per cent. saturated. He had, however, met with one or two cases of death which must, from the circumstances, have been due to carbon monoxide poisoning, but in which no CO could be found in the body. The victim had evidently been gassed so badly that he died from the after-effects some hours later, having been freed in the meantime from the CO by ventilation. If there were 1 per cent. of CO in the air breathed, 50 per cent. saturation would be reached in fifteen minutes, and 80 per cent., causing death, in twenty-three minutes. If, however, the victim were exerting himself while absorbing the first part of the CO, he might be breathing four or five times as much, and reach the 50 per cent. saturation within five minutes. The recognition of CO after death presented usually no difficulty. The only condition with which it was liable to be confused was poisoning by nitrite. The red colour seen after death in the lips and parts of the skin was very characteristic of CO poisoning. The colour of the blood and organs when the body was opened was very definite. If death had been rapid, it would be found that the blood taken from the spleen was much less highly saturated than elsewhere, and in case of very rapid death the saturation on the right side of the heart would not be very high.

The most common form of death from CO poisoning was suicide as a result of inhalation of the fumes of a gas stove. The number of cases of such suicide had increased very rapidly of recent years, owing, apparently, to the spread of knowledge of its relative ease. In Great Britain cases of accidental poisoning by gas were few, and did not appear to be increasing, notwithstanding the great increase in gas consumption; but in the United States they were far more frequent, probably owing to the much greater proportion of carburetted water gas used there. Carburetted water gas contained about 30 per cent. CO, whereas coal gas contained usually from 7 to 10 per cent. In many English towns, however, enough water gas was mixed with coal gas to raise the percentage to 15. On the other hand, the amount which could escape from the ordinary lighting burner was much less than was formerly the case when the old black flame burners were in general use. Apart from gas suicide, perhaps the most important cause of CO poisoning was now the gas mixture which escaped from the engines of petrol-driven motor vehicles owing to imperfect combustion. On the average this contained about 7 per cent. of carbon monoxide. Many cases of partial—occasionally fatal—poisoning occurred in garages where an engine was set going to warm up the carburettor before starting, and the precaution had not been taken of opening the door wide. A formidable problem was the ventilation of tunnels for motor traffic. The possibility of intoxication from CO ought always to be present to the minds of police and coroners.

In the treatment of CO poisoning the first thing was to apply artificial respiration without a moment's delay. It was probable that most of the blood had not had time to become highly saturated, and in that case recovery might be rapid. The patient must be kept at rest; exertion might cause fainting, dilatation, or paralysis of the heart. There was a rather unfortunate popular idea that, apart from artificial respiration, the most important thing in gas poisoning was the administration of pure oxygen. When pure oxygen was given in a case of CO poisoning the pressure of oxygen in the lung alveoli would be increased six or seven times, so that CO, other things being equal, would be turned out of the blood six or seven times as fast; but in the course of the poisoning far too much CO_2 had been removed from the body. The consequence was, with oxygen, a tendency to the cessation of breathing and the slowing up of circulation, and this went far to neutralize the good effect of the oxygen itself. The best result could be obtained by a mixture of oxygen in at least 5 per cent. of CO_2. An uninformed public opinion had demanded oxygen as the best remedy, and that had militated against the use of carbon dioxide in this country. American experience, however, had shown the great advantage of adding CO_2 to oxygen. CO_2 also prevented the subsequent tendency to pneumonia.

Sir WILLIAM WILLCOX, after paying a tribute to Professor Haldane, and to his courage in undertaking the experiments upon himself, said that a few years ago he was on a committee which sat for nearly a year considering tests for drunkenness, and a good deal of evidence was brought forward; but he did not think a single witness told the committee what had been stated that evening—namely, that carbon monoxide poisoning might show similar phenomena to alcohol intoxication. Perhaps a not unimportant point was the percentage of carbon monoxide in tobacco smoke. He believed the percentage in tobacco might be as high as 5 per cent. As Professor Haldane had pointed out, carbon monoxide poisoning was insidious in its onset. Persons became unconscious without realizing that they were affected. He had been interested to hear him advocate a mixture of oxygen and CO_2 as a respiratory stimulant, because, three or four years ago, writing a little brochure on the treatment of carbon monoxide poisoning for one of the gas companies, he had advocated the use of oxygen or air mixed with CO_2. He had also emphasized the danger of any violent moving of the person suffering from the poisoning, as this might entail serious damage to the heart. It had occurred to him that it would be a useful treatment for coal gas poisoning to give a solution of hydrogen peroxide, mixed with normal saline, intravenously. He had used this in two cases, and both did extraordinarily well and got better, but whether this was a case of *post hoc* or *propter hoc* he could not say.

Sir BERNARD SPILSBURY, taking up the reference by Professor Haldane to the controversy as to whether carbon monoxide had any direct action upon the tissues apart from the changes in the blood, by reducing the oxygen-carrying capacity, said that it had long been known that in the more chronic forms of profound anaemia very characteristic changes occurred in the body, such as an extremely fatty disease of the heart muscle and the kidneys. It was not always realized how rapidly such changes could occur in a relatively short period of anaemia if the oxygen-carrying power of the blood were lowered. He had had the opportunity of investigating cases where the haemoglobin percentage had been considerably reduced for some time, and it only required a severe anaemia of three or four days' duration to induce these fatty degenerations. If fairly tough organs like the liver and kidney could be so affected by anaemia of that duration, certainly the brain cells must be affected, and thus the profound effects of a prolonged oxygen deprivation could be accounted for. With regard to the dangers of chronic carbon monoxide poisoning to the modern community, there could be little doubt that the exhaust gases of motor vehicles constituted a serious menace in the future. He had very little doubt that many cases of chronic CO poisoning had been overlooked in the past and present. It had occurred among workers in large garages where engines were running frequently. Unless the garages were well ventilated the possibility of CO poisoning was very present. Sir Bernard Spilsbury went on to describe a case in which a doctor friend of his, having recently moved into a new house, found that all the members of the family except himself (who was frequently away from home) were suffering from some form of illness which could not be traced to any cause. His wife and children suffered from an indefinite malaise, and one of the servants, who spent most of her time in the kitchen, had a return of pulmonary tuberculosis from which she had suffered many years before. The drains and other parts of the house were thoroughly examined without any cause being discovered. On going over the house, at the doctor's request, he found that a coke stove had been installed in the kitchen for destroying refuse, and this was kept burning day and night. It was a well-made stove, with a good flue, but it had the serious defect that a metal lid, which fitted quite loosely, was lifted off when it was desired to put in fresh refuse. He suggested to the doctor that he should leave a trapped mouse on the kitchen mantelpiece. Within three days he received the dead mouse and examined the blood, in which he found a considerable amount of carbon monoxide poison. The stove was removed, and all the illness disappeared from the house from that time onwards. There was no doubt that the family had been suffering from the gases formed by the slow combustion of the coke in the stove. In estimating the fatal saturations, he had never obtained figures quite so high as Professor Haldane had suggested—namely, 80 per cent.; he had occasionally got 75 or 76 per cent., but in most of the fatal cases he had investigated the figures were nearer 60 to 65 per cent. as an average. In very few cases had he found death occurring with a low percentage, and there could be little doubt that whilst a normal person required a very high percentage for a fatal dose a person in ill health might die with a very much lower percentage in the blood. He recalled the case of a young woman who committed suicide in this way, and in her case the saturation was only 45 per cent. She had with her a child of 7, who was unconscious, but survived. The woman herself was suffering from advanced chronic tuberculosis of the lungs, and he thought the low fatal dose was occasioned by the fact that she would naturally offer less resistance than a healthy person. In two other cases, in which the percentage was about 50, one was an old and feeble person, and the other was suffering from cancer of the stomach. With regard to the recognition of carbon monoxide in the body after

death, the post-mortem appearances were, as Professor Haldane had pointed out, extremely characteristic, so that one could often diagnose a case of carbon monoxide poisoning on sight. But there was one trap which might mislead a medical man not familiar with the changes which occurred. A doctor, searching through the organs of the body, might find nothing at all to indicate the reason for death, and then be suddenly struck with the fact that the blood in the organs looked bright red, so that he would jump to the conclusion that it was a case of coal gas poisoning. But that bright redness was entirely due to the changes in the viscera after exposure to air. The blood in the viscera was of dark colour when first exposed, but after exposure it became a bright red. One other form of poisoning in which sometimes the blood and even the viscera might have rather a bright colour was cyanide poisoning. He thought that was almost the only condition in which the mistake was likely to be made.

Mr. MASTERMAN, of the Gas Light and Coke Company, mentioned that his company had made some tests on the carbon monoxide in the street atmosphere. They had found that at mouth level, in a London street in ordinary traffic, there were about 20 parts of carbon monoxide per million, but that when, after a traffic block, the traffic was just restarting and the engines were accelerating, the proportion went up to 60 parts.

Professor HALDANE said that he wished the Gas Light and Coke Company would make similar experiments during a London fog, because under those conditions the proportion of carbon monoxide was likely to be greatly increased.

CARBON MONOXIDE POISONING.

AT a meeting of the Aberdeen Medico-Chirurgical Society on June 5th, with the president, Dr. CHARLES FORBES, in the chair, Dr. ROBERT RICHARDS made a communication on carbon monoxide poisoning, with special reference to its medico-legal significance.

Dr. Richards introduced his paper by saying that the whole subject of CO poisoning was intimately bound up with the question of suicide, and that the increase in the suicide rate had been a noteworthy characteristic of recent statistics in most countries and constituted a grave social problem. The war years had been marked by a decrease in the suicide rate, but since that time the rate of increase had rapidly mounted. In England and Wales, for example, in 1918 there were 2,765 deaths from suicide, and in 1928, 4,872; in Scotland for the same years the figures were 190 and 474. An extraordinary change in choice of method of suicide had also taken place during that period. In Scotland and England the number of coal gas suicides had increased sixfold—in Scotland from 18 to 103, and in England from 176 to 1,088. Even in Aberdeen, although the figures were small, practically the same increase had been seen—from 2 cases in 1919 to 14 in 1929. There were nearly as many coal gas suicides per year in Aberdeen as there were in the whole of Scotland in 1918. The increase had been greater in the female sex, for while gas suicides amounted to 23 per cent. of all cases, the percentage among males was 19.5, contrasted with 28.6 among females. The rise in suicidal cases was probably even greater than these figures showed, since many doubtful cases were attributed to accident from want of convincing proof of suicide. Actually the deaths arising from purely accidental inhalation of coal gas during the same period had not increased. Accidental carbon monoxide poisoning occurred from any apparatus where incomplete combustion resulted in the production of this gas—from coke stoves, geysers, explosives, and motor-car exhausts—but the main source was from the domestic gas supply. The recent report of the Departmental Committee of the Board of Trade on Deaths from Gas Poisoning gave the following list of possible causes of accident: turning the wrong tap where two were close together; gas supplied from a pre-payment meter being left alight and becoming exhausted while the victim slept, and coins placed in the meter by some other person; drunkenness, absence of stop-pins, taps too loose, taps turned on when articles were hung on the gas bracket or removed therefrom, taps near the floor kicked or knocked by removing furniture, kettles or saucepans boiling over and extinguishing the flame, absence of sense of smell on the part of the victim. Occasionally gas entered a dwelling by percolation through the floors from a burst main. Accident could only be excluded by a survey of the attendant circumstances in each case, and it was known that accidental conditions could be simulated by a murderer, as could also evidence suggesting suicide. The medico-legal question of whether a case was homicide, suicide, or accident was of some importance, and was likely to assume greater importance in the future.

The CO content of coal gas constituted its one important toxic element. The gas supply in different places contained varying proportions from 5 or 10 per cent. to as high as 30 per cent., and statistics showed that the occurrence of asphyxiation rose in direct proportion to the CO content. It was not commercially practicable or economical, however, to limit this constituent of the domestic supply, and such had been the finding of the Departmental Committee. It had also been found impracticable to add any substance to gas which might quickly attract attention to escapes or render suicide more repellent, since any such irritant would affect normal consumers whenever the gas was turned on and left unlighted, even for a moment. It would, moreover, tend to discourage the use of gas and might cause damage to fittings. The toxic action of CO was due to its union with haemoglobin, thus depriving the tissues of oxygen. The attraction of the haemoglobin for this gas was from 200 to 300 times that for oxygen, so that as long as carbon monoxide was present in the atmosphere it became fixed cumulatively in the blood. From 20 to 30 per cent. saturation of the haemoglobin produced headache and nausea, from 40 to 50 per cent. collapse with inability to use the limbs, and over 55 per cent. unconsciousness and rapid death. The rate of elimination of CO from the blood stream in cases of survival was comparatively rapid, but varied with the percentage saturation. Where this did not exceed 40 to 50 per cent., one-half of the gas was eliminated within an hour, as had been shown by Haldane and Henderson. But where the saturation was sufficient to cause first hyperpnoea and then coma the rate of elimination was slow on account of the absence of respiratory movement and reduction of tissue carbon dioxide, which normally acted as a stimulus to respiration. The rate of elimination had been of importance in medico-legal cases where delayed carbon monoxide poisoning had been claimed as the cause of death.

Dr. Richards discussed the diagnosis of carbon monoxide poisoning from the clinical aspect, and also demonstrated the usual tests for its presence in the blood—the dilution test, Kunkel's test, and the spectroscopic test. He emphasized the importance of differentiating nitric oxide haemoglobin from carboxy-haemoglobin, since the possible presence of this substance was important from the medico-legal standpoint. In conclusion, he gave an outline of the modern treatment of gas poisoning. The primary object was to eliminate the CO from the blood with all possible speed, so curtailing prolonged asphyxial effects and consequent tissue damage. This was best achieved by the inhalation method immediately upon removal from the toxic atmosphere, and a mixture of 7 per cent. carbon dioxide and 93 per cent. oxygen was recommended. This treatment in America had given most dramatic results in cases of rapid asphyxiation occurring in firemen and blast furnace workers, who, though so nearly dead as to require artificial respiration, had by this means sufficiently recovered within twenty minutes as to be fit to return to duty.

In the discussion which followed the paper it was agreed, on the suggestion of Professor Ashley W. Mackintosh, to approach the local fire brigade and ambulance associations with a view to the provision of the necessary apparatus, cylinders of carbon dioxide, and oxygen for this purpose, and of facilities for the instruction of personnel in their use.

THE DICK TEST IN PREGNANCY.

AT a meeting of the Edinburgh Obstetrical Society, with the president, Dr. H. S. DAVIDSON, in the chair, Drs. DUGALD BAIRD and ROBERT CRUICKSHANK of Glasgow contributed a paper on the value of the Dick test in pregnancy.

They said that during 1929 an investigation was conducted at the Glasgow Royal Maternity and Women's Hospital into the value of the Dick test—that is, the cutaneous reaction to the intradermal injection of scarlatinal streptococcic toxin—as an index of susceptibility to puerperal sepsis. Because of the generally accepted view that the toxins produced by the scarlatinal and puerperal haemolytic streptococci were identical, it was thought possible that sensitiveness to the one might indicate a similar degree of susceptibility to the other, and, if this were so, that the test might be of value in the prophylaxis of puerperal sepsis. The Dick test was performed in a series of 600 pregnant women, either during labour or in the last few weeks of pregnancy. Careful histories were taken on cards designed for the purpose, particular note being made of previous streptococcal infection—for example, scarlet fever, tonsillitis, puerperal sepsis—of the obstetric history, and of the health during the current pregnancy. Full particulars were obtained later regarding the mode of delivery, the presence of lacerations, and the puerperium in 500 of these cases; where the puerperium was morbid, even although not notifiable according to the British Medical Association standard, it was classed as puerperal sepsis, care being taken to eliminate those cases of pyrexia due to other causes, such as urinary infection. A number of cases with a positive Dick test which developed pyrexia in the puerperium were retested immediately after the pyrexial period to see if any change in the reaction had occurred. Some of these were again tested six months later. They found that 22 per cent. of pregnant women gave a positive reaction to the Dick test, primiparae giving a slightly higher rate than multiparae—25 per cent. as compared with 21.5 per cent. The reaction seemed to be more intense in primiparae, irrespective of age, than in multiparae. In the latter there was a decrease in the intensity of the reaction in the older age groups, which might indicate that with each pregnancy the patient had a chance, by repeated slight infection, of becoming more immune. The incidence of puerperal morbidity also became less with advancing years in multiparae, but remained constant for all ages in primiparae. The incidence of puerperal sepsis was so dependent on the general health of the patient and upon the type of delivery that any reliance on the Dick test as an indication of liability to sepsis would not be justifiable. It appeared, however, that in the present state of obstetric practice an attempt to produce a temporary immunity with a concentrated anti-scarlet fever serum in all suspect cases at the time of delivery might reduce the incidence of puerperal sepsis.

The Vaginal Flora in Pregnancy.

This paper was followed by another contribution on a study of the vaginal flora in pregnancy by the same workers, Drs. Baird and Cruickshank. This investigation, which had been carried out during the past two years, and was not yet completed, had been originally intended (*a*) to identify the bacterial flora of the vagina and the reaction of the vaginal secretion and to study the changes which they undergo as pregnancy advances, and (*b*) to discover whether the character of the vaginal flora had a relation to the occurrence of puerperal sepsis. The physiological changes in the flora of the vagina were first reviewed, special attention being drawn to the apparently dramatic change at puberty from a sparse coccal flora and an alkaline reaction to a flora consisting entirely of Döderlein's vaginal bacillus associated with a highly acid reaction of the vaginal secretion. This change had been attributed by Miura, a Japanese worker, to the deposition of glycogen in the superficial vaginal epithelium when ovulation began and the bacterial fermentation of the glycogen as glucose for the production of lactic acid in such concentration as to destroy all organisms save the aciduric Döderlein's bacillus. Miura also stated that in pregnant women there was an increased acidity of the vaginal secretion as pregnancy advanced.

The present investigation dealt with the vaginal flora of 200 pregnant women, a large proportion of whom attended at monthly intervals from the third month of pregnancy until term. Swabs were taken from the vaginal vault and smears and cultures made. The *p*H of the vaginal secretion, which was collected at the same time with a long-handled spoon, was estimated by the "capillator" method.

A classification into three grades of vaginal flora was made: Grade A, composed entirely of Döderlein's bacillus, the *p*H of the secretion varying only from 4.0 to 4.4; Grade B, containing a mixture of Döderlein's bacillus and diphtheroids, *p*H 4.6 to 5.2; and Grade C, consisting of an abundant heterogeneous flora of diphtheroids, enterococci, staphylococci, and occasionally vibrios and coliform bacilli, *p*H 4.8 to 6.8, with a more common range of 5.2 to 5.6. Large epithelial cells were particularly numerous in Grade A flora.

Of 200 pregnant women when first seen, 56 per cent. had Grade A flora, 10 per cent. Grade B, and 34 per cent. Grade C. Of the women who were followed throughout pregnancy there was found a remarkable constancy in the vaginal flora and in the *p*H of the vaginal secretion in those cases with Grade A flora. The women with Grade B or Grade C flora were divided into those with pus cells in the vaginal smear—an indication of infection of the cervix or vagina—and a group with "idiopathic" Grade C flora—that is, an abundant mixed bacterial flora without pus cells. The flora in the former group remained Grade B or Grade C throughout, but in the latter group the flora changed from Grade C to Grade A in two-thirds of 21 cases followed to term, the improvement occurring usually about the sixth or seventh month of pregnancy.

The thesis was formed that there existed some relation between the vaginal flora and ovarian activity, a Grade A flora being a reflex of actively functioning ovaries, whereas hypo-ovarianism is reflected in a Grade C flora. The association of an idiopathic Grade C flora with greater age and with a tendency to repeated abortion and the change-over from a Grade C to Grade A flora during pregnancy were findings which support this view. No evidence had been found to indicate that a Grade C flora increased the susceptibility to puerperal sepsis, but the number of women examined was still too small to allow of definite conclusions.

MENSTRUATION IN SCHOOLGIRLS.

AT a recent meeting of the London Association of the Medical Women's Federation a report on an inquiry into menstruation in schoolgirls based on over 6,000 replies to a questionary by a committee of the association was presented to, and passed by, the association. The following is a summary of the information derived from the questionary:

The distribution of the interval between the periods is peculiar, and suggests a predilection for whole weeks—that is, the frequencies recorded at 21, 28, and 35 days seem exceptionally high. The most frequently occurring interval is centred on 28 days.

The presence or absence of pain does not seem to be sensibly correlated with length of interval.

The regularity of the period is significantly but slightly related to pain, the proportion recorded as regular being more in the "no pain" group than in all others.

The average duration of the period is definitely but very slightly lower among girls taking full exercise throughout the period.

The duration is longer (about one-third of a day) in those who suffer pain than in those who do not.

Slightly more than half of the girls studied do not suffer pain or discomfort, however slight, at any time during the menstrual period.

Of those recorded as suffering pain, the majority suffer *during* the period only.

The differences in the incidence of pain in the three groups of schools (high, secondary, and boarding schools) when analysed separately are not very large.

The distribution of the number of girls taking full exercise throughout the period in the three groups of schools shows appreciable differences, and contrasts with the much smaller differences between the group of schools in respect of incidence of pain.

Pain and exercise seem to be definitely related one to another, but from these data it is impossible to suggest which is cause and which is effect.

The incidence of disturbed happiness or general health, headache, and constipation is definitely related to the presence of pain, the influence being most apparent in the case of disturbed health and happiness and least in headache and constipation.

Absence from school is definitely related to the occurrence of pain, but regular or frequent absence is very rare at any time during adolescence.

The time in the menstrual cycle at which the pain occurs is related to all the above factors. The incidence of all of them increases steadily and gradually in the following order: with no pain; pain before the period; during the period; after; and before, during, and after the period.

Comparison of the whole series and that obtained by excluding girls with a history of one year or less suggests that at the early period of menstruation a smaller proportion of girls suffer pain than later, during the age period studied (onset to 18).

Analysis of the whole series by years shows that the rise of incidence of pain is steady and gradual throughout the menstrual histories studied. The rate increase over 8 years is less than three times the original value.

The incidence of disturbed general health and happiness also increases progressively with length of menstrual history.

Irregularity definitely decreases in incidence with increasing length of history.

The average duration of the period shows no tendency to rise or fall with increasing length of history.

The details of the investigation, and a commentary on its results, will shortly be published.

CANCER OF THE UTERUS.

AT a meeting of the Section of Obstetrics of the Royal Academy of Medicine in Ireland, held in Dublin at the Royal College of Physicians, with the president, Professor A. H. DAVIDSON, in the chair, Dr. NINIAN FALKINER demonstrated a specimen from a case of carcinoma of the cervix complicating pregnancy.

The patient, aged 39, married fifteen years, having eleven children, the last in January, 1929, was admitted on January 29th, 1930, complaining of bleeding, something coming down, and frequency of micturition. Menstruation had been regular, and the last period had taken place on January 15th. There had been a particularly heavy bleeding on January 1st. General examination revealed a wasted anaemic patient weighing 6 st. 7 lb. Her red blood corpuscles numbered 3,500,000, and her haemoglobin was 60 per cent. On parting the labia and introitus a fungating mass could be seen arising from the cervix; no blueing was noted. The uterus was enlarged, and the growth could be felt implicating the utero-sacral ligaments. Carcinoma of the cervix was diagnosed, and the enlargement of the uterus was put down to pyometra. At operation the uterus was seen to be enlarged, but this condition was thought to be due to pyometra, and hysterectomy was proceeded with. The bladder could not be pushed down, and a total operation was done instead of the Wertheim. On the fifteenth day the patient complained of difficulty in holding her water. Examination revealed a vesico-vaginal fistula. She had deep *x*-ray therapy and left hospital feeling well, and is to return in a few months for re-examination. The specimen was examined after removal and the following report was received: Carcinoma of the cervix, squamous cell in type; pregnant uterus containing a three months foetus; some haemorrhage from placenta; ovary contains corpus luteum of pregnancy.

Dr. BETHEL SOLOMONS showed two specimens of uterine cancer.

The first had been taken from a patient, aged 45, single, who had complained of a sanguineous discharge, which sometimes became offensive, for seven or eight months. She was otherwise healthy, except that she had become stout. Examination revealed a small, hard uterus, and, the cervix being healthy, subtotal hysterectomy was done. The uterus was opened immediately, and as it was obviously malignant the cervix was removed with both adnexa. The patient made an uninterrupted recovery.

Dr. Solomons said that this type of case brought up the important question what was the correct treatment for a woman who desired to get well in the shortest possible time when there was doubt about the diagnosis—and in this case there was much doubt, as the uterus felt infantile. He believed that the treatment he had followed was the best. A preliminary curettage would have delayed matters; a total hysterectomy was unnecessary, because the cervix was normal; and the diagnosis of malignant disease was impossible until the uterus was opened.

Dr. Bourke's report of the specimen was as follows:

Macroscopically the cervix shows a pearly, greyish mass, extending from the lumen and infiltrating the wall in a parallel line; it measures almost a quarter of an inch. The cavity of the uterus presents a ragged verrucose surface. The endometrium on cross section appears greyish white in colour and slightly uneven.

Microscopically the cervix shows dense infiltration of the wall by solid finger-like masses of epithelial cells; there is no keratinization. This is a solid carcinoma of low malignancy. The uterus presents a picture of massive hypertrophy of the glandular tissue; in some places the stroma is replaced by solid masses of cells similar to those seen in the cervix. This is apparently an extension upwards of the malignant process originating in the cervix. From this the condition is either one of adenocarcinoma of the cervix spreading upwards or of the body of the uterus spreading downwards.

Adenocarcinoma of the cervix in a nulliparous unmarried woman, said Dr. Solomons, was most unusual. Adenocarcinoma with a uterus comparable to one of infantile type was also unusual. Cervical adenocarcinoma might spread in either direction. Corporeal carcinoma was most likely to make its way towards the abdominal cavity.

The second specimen shown by Dr. Solomons was of a uterus containing an enormous cervical carcinoma, which he had removed from a pregnant woman, aged 28—a 5-para who had had four healthy children.

The patient was admitted complaining of a foul-smelling discharge, and appeared ill. The foetus was about 28 weeks, and the foetal heart was audible. On vaginal examination a freely bleeding cauliflower mass was discovered springing from the cervix. The os was about four fingers dilated and the membranes were ruptured. Believing that fatal haemorrhage would occur if the patient was delivered vaginally, Caesarean section was decided on. The uterus was opened, after which it was intended to remove the infant, and then the placenta *in situ*; but as the latter presented it was speedily removed, after which a live baby weighing 2 lb. 13 oz. was delivered. The head showed a marked caput succedaneum, caused by the definite disproportion set up by the enormous growth. It was then found that the tumour was of a size larger than a clenched fist, and that it had retracted high over the head; total hysterectomy was quickly done. The patient recovered from the immediate effects of the operation and left the hospital. The infant has put on weight and appears likely to live. The pathological report was as follows:

Macroscopically the uterus is enlarged, and shows a recent operation wound on its anterior aspect; it corresponds to the post-partum uterus. There is a large cauliflower-like mass springing from the external os; on opening the cavity the uterus is full of blood clot, but presents no other abnormality. The tumour at the cervix is white in colour; on section it is outlined from the cervical tissue.

Microscopically sections show solid columns of rather large cells closely packed together and infiltrating the surrounding tissues. There are no cell nests present, but from the appearance of the cells and their arrangement there can be no doubt that this growth originated from the squamous epithelium of the portio; the line of cleavage between the malignant process and the cervical tissue is well marked, and is surrounded by a zone of small round-celled infiltration. The cervical tissue towards the uterus shows scattered areas of round-celled infiltration.

UREA CONCENTRATION TEST.

THE fourth summer meeting of the Association of Clinical Pathologists was held at the Cheltenham General and Eye Hospital on June 14th, with Dr. J. B. DAVEY in the chair. Dr. T. C. HUNT described a combination of a water excretion and urea concentration test for renal function. Dr. S. C. DYKE gave a brief preliminary report upon the phosphate concentration test of Brain and Kay for estimation of renal function; the speaker had found the test somewhat unwieldy for ordinary clinical use. Dr. A. F. S. SLADDEN, discussing the importance of the urinary acid-ammonia ratio as an index of renal health, pointed out that this ratio was extremely constant, and that any departure from the normal in the absence of alkali therapy was an indication of disturbed renal function. Dr. DYKE opened a discussion on the urea concentration test, in the course of which he asked at what stage of the test a specimen of blood for estimation of urea should be taken; opinion differed widely on this point. The speaker stated that inasmuch as he regarded the test as one of the concentrating power of the kidneys, it had been his custom always to take the blood at the third hour. Dr. J. B. DAVEY reviewed the results of the urea concentration test as an indication for complete prostatectomy. In the course of the afternoon session demonstrations were given as follows. Dr. A. RENSHAW: a self-filling burette for routine analytical work, a new type of chamber for counting the cells of the blood, and other technical devices. Dr. DYKE: mice showing results of Zondek-Aschheim test for pregnancy. Dr. A. L. TAYLOR: recent additions to the pathological museum of the British General Hospital. Dr. E. N. DAVEY: pathological specimens from the Gloucester General Hospital, and an unusual type of typhoid bacillus isolated from a suppurating mesenteric cyst. Dr. J. R. COLLINS, senior physician to the Cheltenham Hospital, addressed the members on the "Sins of the pathologist." In the course of the evening a party of members was shown round the baths by Mr. T. Holmes, senior surgeon to the hospital.

Reviews.

THE CEREBRO-SPINAL FLUID.

IN his monograph on the cerebro-spinal fluid[1] Dr. RISER has summarized the work done and the results obtained by the Toulouse school of neurology during the past ten years. In describing the methods adopted for obtaining access to the cerebro-spinal fluid spaces via the different avenues of approach, he has made very useful practical suggestions, which are the fruit of a large number of observations. The pitfalls, the complications, and the abnormal sequels of lumbar and cisternal puncture are carefully outlined. The methods of biochemical examination of the fluid are only briefly mentioned, the author being more concerned to point out the clinical bearing of those experimental researches into the origin, circulation, and absorption of the fluid which have been carried on by his colleagues. Observations upon experimental and acquired hydrocephalus have led him to the view that the pial capillaries cannot be credited with any contribution to the fluid; this probably all comes from the choroid plexuses, whose epithelium is endowed with no selective permeability. He holds that there is a continuous circulation of the fluid from the ventricles to the spinal cord, but that nowhere does it come into intimate contact with the cells of the central nervous system. Therefore drugs which may be introduced into it, either from the blood stream or by direct injection, do not reach further than the most superficial layer of the brain and spinal cord. Absorption of the fluid, he finds, is by the veins, and not to any noteworthy extent by the lymphatics.

For the localization of spinal cord lesions associated with interruption of the intrathecal circulation, as by a tumour, Dr. Riser advocates the use of a heavy lipiodol solution injected into the lumbar region. After the injection the patient is placed prone upon a horizontal table, which is then tipped so as to bring the head lower than the pelvis. The lipiodol then flows towards the skull, and its level of arrest, when this occurs, gives the lower level of the obstruction. This method, he claims, has the advantage that the comparatively hazardous operations of cervical or cisternal puncture are avoided, and that the lipiodol, if arrested in this upside-down position of the patient, returns to the lumbar region when the normal erect position is regained, and does not remain as a source of irritation in contact with the obstructing mass. Further, if, after a single lumbar injection of lipiodol, a level of imperfect or suspected arrest is made out, the patient may be again placed in the inverted position on subsequent days and the level of arrest confirmed as often as may be desired without further injection. When the lipiodol passes upwards into the base of the skull no untoward effects have been noticed, and it all returns to the lumbar region when the patient is sat up. The occasional disadvantages of this technique are discussed; it has much to recommend it, and has not been as widely used as it deserves. The concluding chapter gives a summary of the cerebro-spinal fluid reactions in those pathological conditions in which its analysis gives most information. However, the information which it does or may afford is not set down, although the methods suggested for use in each case are given.

What Dr. Riser has to say has been said clearly and concisely. It is not unnatural that local bias in favour of his fellow workers' results should show itself in places, but on the whole conflicting evidence is faithfully dealt with, and his conclusions and recommendations will be generally accepted. The book is a valuable contribution to this subject.

SURGICAL ASPECTS OF OTOLOGY.

Otologic Surgery,[2] by Dr. SAMUEL J. KOPETZKY of New York, fills a useful place in the literature of otology, being directed to its purely surgical aspect. It should appeal especially to those recently placed in charge of aural clinics and to those numerous general surgeons who either from necessity or choice include operations on the ear in their practice. The surgical treatment of new growths and of facial paralysis are not included, and these may be regarded as on the fringe of the subject and not strictly within the scope indicated. Otherwise the reader will find a modern and convincing presentation of all that relates to the surgery of the ear. Dr. Kopetzky lays a sound basis of surgical pathology upon which he builds the various methods of treatment, so that we are presented with a book whose claims can be advocated without reserve, although the value of some therapeutic details might be the subject of varied opinions.

In the chapter devoted to the simple mastoid operation the pathology of acute otitis media and its extension to the mastoid process is described in a masterly fashion. The author describes two types—the coalescent and haemorrhagic types of mastoiditis—which must be familiar to all aural surgeons, though not always clearly recognized as separate clinical and pathological conditions. He traces skilfully the importance of these in relation to blood infections, which are described in the chapter on otogenous systemic infections including sinus thrombosis. Great importance is attached to examinations of the blood, and in particular to estimations of the haemoglobin content. The author advocates transfusion of whole blood, when the haemoglobin percentage has dropped to 55, owing to blood destruction by the haemolytic streptococcus. He evidently attaches even greater importance to laboratory tests than is usual in this country, but he shows good reasons for this and devotes a valuable chapter at the end to this matter. There is a clear description of the radical mastoid operation, with its numerous pitfalls and excellent advice in the management of these common but really difficult cases. In the chapter on meningitis the Haynes-Kopetzky operation of trephining the occipital bone to drain the cisterna magna is described and advocated. Although this operation presents some superficial attractions it never succeeds, and we feel that it should no longer be advocated simply that something may be done for the patient. Dr. Kopetzky, however, has made such valuable contributions to the study of meningitis that this chapter is one of the most fascinating. The chapter on brain abscess gives useful information in the diagnosis and treatment of the condition, but it somehow lacks the personal authority which is conveyed elsewhere in the book at first hand.

There are a few literary blemishes such as the persistent use of the word drum for the tympanic membrane instead of the tympanum, but the writing on the whole makes pleasant and smooth reading. The book is a valuable contribution to the literature of otology, and will repay careful study by every aural surgeon.

PHYSICAL EXAMINATION OF THE LUNGS.

SHOULD the diagnosis of diseases of the chest be sought for by inductive or by deductive methods? Dr. KRAETZER, in his book *Procedure in Examination of the Lungs*[3] is emphatically in favour of induction. It is very doubtful if a hard-and-fast choice of either method could be made for the whole art of diagnosis; and even the author, in his last chapter, admits that in the case of pulmonary tuberculosis deductive methods must be used. But as a method of learning the art of physical examination of the chest, in so far as this relates to diagnosis, and for the foundation training of students in this branch of medicine, Dr. Kraetzer establishes his case for induction. It is an excellent little book, written in American rather than English, which is perhaps an advantage, for there is not a sentence in it that will leave the reader in doubt of what the author wishes him to learn from it. At first sight the scheme of physical examination suggested seems rather muddled, but only because it differs from the conventional system, and a little thought will show it to be both logical and thorough. There is a refreshing personal flavour running through the whole book; the student who

[1] *Le Liquide Céphalo-Rachidien.* Par Dr. Riser. Paris: Masson et Cie. 1929. (6¼ × 9¼, pp. 250; 24 figures. 28 fr.)

[2] *Otologic Surgery.* By Samuel J. Kopetzky, M.D., F.A.C.S. Second edition, revised. New York: P. B. Hoeber, Inc. 1929. (Med. 8vo, pp. xviii + 553; 104 figures, 4 plates. 8 dollars net.)

[3] *Procedure in Examination of the Lungs.* By Arthur F. Kraetzer, M.D. With a foreword by James Alexander Miller, M.D. Oxford Medical Publications. London and New York: Milford, Oxford University Press. 1930. (5¼ × 8¼, pp. xiv + 125; 15 figures. 8s. 6d. net.)

reads it will find himself in the presence of a quick-tempered and emphatic chief, a "real, sure-enough, honest-to-goodness" teacher, rather scathing about the inanities that he has heard repeated year after year by his successive classes, but keenly sympathetic to real difficulty, and full of encouragement for the slow and painstaking. The book can be warmly recommended to all training schools. It may contain many conclusions with which other physicians might disagree, but this is unimportant, since the foundation and main structure are exceedingly sound.

PSYCHOLOGY.

A VOLUME entitled *Psychology: Normal and Abnormal*,[4] by Dr. J. W. BRIDGES, professor of psychology in the Faculty of Medicine of McGill University, is written with special reference to the needs of the medical student and practitioner. The author observes that, while the colleges at present generally recognize the importance of psychology in the medical curriculum, no suitable textbook is yet available for a course for medical students. This book is an attempt to meet the requirements of such a course, and on the whole it would seem that Dr. Bridges has adequately carried out his by no means easy task. The subject-matter has been judiciously selected, and the book provides the student with a sufficiently concise and comprehensive outline of psychological teaching, both theoretical and applied, to meet his needs. Those who aspire to a diploma in psychological medicine, and who have had no previous grounding in the elements of psychology, will probably find this volume helpful as an introductory textbook, though it will no doubt be necessary for them to consult also more advanced and specialized works.

The Psychology of the Adolescent[5] by Dr. LETA HOLLINGWORTH, professor of education, Teachers College, Columbia University, is a thoughtful, admirably written, and well-balanced book, which will be studied with advantage by parents and teachers. The author writes objectively and lucidly, and does not confuse the mind of the reader by discussing the theories of the various psychological schools or by the use of unnecessary technical language. A good case is made out in this book for the desirability of educated parents making themselves acquainted with the problems of adolescence. As the writer observes, to have been an adolescent some years ago is not necessarily, or even probably, to remember what an adolescent is like. To have been an infant is not to know what an infant's problems are. Each of the developmental periods of life brings its own characteristic problems, minimizing and obscuring those which preceded. Therefore parents, being themselves engrossed with the problems peculiar to maturity, realize but dimly the adjustments through which the boy or girl in the "teens" is passing. The information conveyed in this book is certainly of a kind to assist parents and teachers to gain increased insight into the problems, aspirations, outlook, and vocational possibilities of the young people for whose guidance or education they may be responsible.

In a volume on *The Science of Living*[6] Dr. ALFRED ADLER endeavours to show how the psychological principles he has elaborated have a practical bearing upon the problems of the individual in relation to his work, social environment, and sex life. Here, as in his other works, the author, with considerable skill and ingenuity, though not always quite convincingly, endeavours to interpret human activities, both normal and abnormal, as a struggle against a sense of inferiority—and, conversely, as a striving to gain a position of superiority. Mr. Phillipe Mairet writes an introductory note to this volume, in which he explains the pedagogic and social aims of the Individual Psychology Movement, of which Dr. Adler is the founder.

[4] *Psychology: Normal and Abnormal.* By James Winfred Bridges, Ph.D. New York and London: D. Appleton and Co. 1930. (5½ × 8¼, pp. xxii + 552; 24 figures. 12s. 6d. net.)

[5] *The Psychology of the Adolescent.* By Leta S. Hollingworth, Ph.D. London: S. W. Partridge and Co. 1930. (Post 8vo, pp. 256. 6s. net.)

[6] *The Science of Living.* By Alfred Adler. London: G. Allen and Unwin, Ltd. 1930. (5½ × 8¼, pp. 264. 8s. 6d. net.)

AN OUTLINE OF R.A.M.C. HISTORY.

A SCOTTISH member of Parliament, criticizing the manner in which history is taught, declared recently that in the pageant of events too much attention has been given to battle and sudden death, and to the pomp and circumstance surrounding the thrones of certain royal filibusters, while the passage of great social reforms and the gradual betterment of the conditions of the common folk have been largely ignored. After studying *A Short History of the Army Medical Corps*[7] the non-military reader may be inclined to think that there is something in this point of view. Colonel FRED SMITH has set out to tell the tale of the gradual development of the medical services of the British Army, from the days when there were no standing armies up to the present day. In a memorandum he carefully defines the scope of the book. It is written for the use of young soldiers of the R.A.M.C. for examination purposes, and within the compass of ten short chapters—111 pages—the tale is acceptably told. The various changes from one uniform to another, the alterations in the title of the Service, and the adoption of new methods of organization are carefully chronicled. These are interesting in their way, but it is doubtful whether they are of outstanding importance from an examination point of view.

A great part of the book is devoted to records of the award of the Victoria Cross and other decorations to members of the corps. It is well that these deeds of gallantry should not be forgotten; it might, however, be less confusing to the examination candidate if their record was placed in an appendix. The importance of history lies mainly in the lessons that it teaches. The devastating incidence of disease in previous campaigns and its gradual decrease with the enhanced knowledge and wider powers of the medical services should be brought to the young soldier's notice. How better could this be done than through the page of history? In the interesting account of the typhus epidemic at Wittenberg Camp the award of the D.S.O. is carefully chronicled. It should not be forgotten that the Royal College of Physicians of Edinburgh offered its Membership without fee or examination to Major Priestley and Captains Vidal and Lauder. The record of the Special Reserve and the Territorial R.A.M.C. in the great war is dismissed by Colonel Smith in three-quarters of a page. The Haldane Scheme and the activities of the Territorial Army since the war are not mentioned. Yet Territorial officers are being constantly told that in the next war the mistake of Kitchener's Army will not be repeated, and that all development will be through the auxiliary forces as at present constituted. The Army Dental Service is given half a line. So important was this service considered during the war that at least one of the overseas Dominions considered organizing a special dental department, independent of the medical services.

There is a definite demand for a book such as Colonel Fred Smith has written, and those interested in the training of R.A.M.C. soldiers in the different branches of His Majesty's Forces will welcome its appearance. With a little rearrangement, amplification here, and curtailment there, the value of this little history might be greatly increased.

NOTES ON BOOKS.

A Synopsis of Surgery, by Professor E. W. HEY GROVES, maintains its place both as a handy work of reference for the busy practitioner and as a valuable guide to the student entering on his final examination. In preparing the ninth edition[8] the author has carefully revised the whole text and brought it up to date. It is perhaps inevitable in a work presenting so many facts that values should be neglected. The author refers, for example, to Trendelenburg's operation and to the method of multiple excision and ligature in the treatment of varicose veins, and describes briefly the treatment by injection of sclerosing fluids. But he expresses no preferences; he neither

[7] *A Short History of the Royal Army Medical Corps.* By Colonel Fred Smith, C.B., C.M.G., D.S.O., R.A.M.C. (retired pay). Aldershot: Gale and Polden, Ltd. 1930. (Cr. 8vo, pp. 111; 5 plates. Paper cover, 1s. 6d. net; cloth, 2s. 6d. net.)

[8] *A Synopsis of Surgery.* By Ernest W. Hey Groves, M.S., M.D., B.Sc., F.R.C.S. Ninth edition. Bristol: J. Wright and Sons, Ltd.; London: Simpkin Marshall, Ltd. 1930. (Cr. 8vo, pp. viii + 676; 148 figures, 13 plates. 17s. 6d. net.)

evaluates the methods, nor does he present data from which the student might assess their relative merits for himself. The section on the use of radium in the treatment of malignant disease is far too brief to be helpful. Professor Hey Groves has had to face the fact that the whole of general surgery cannot be compressed into a volume of under 700 pages, but we think it a pity that in throwing overboard all except necessities he should have sacrificed a subject of such growing importance as radium therapy. From every other aspect his work, whether in the choice and arrangement of material or in the manner of presentation, is as good as a synopsis of a large subject can be.

The *Treatise on Materia Medica and Therapeutics*,[9] by the late Rakhaldas Ghosh, made its first appearance nearly thirty years ago, and since then it has passed through no fewer than twelve editions, under the editorship in succession of the late Sir Pardy Lukis, Lieut.-Colonel J. T. Calvert, Lieut.-Colonel H. B. Deare, and Dr. B. N. GHOSH. The latest issue of this deservedly popular textbook bears evidence of careful revision; many parts have been rewritten, and almost every drug has received attention in the light of recent pharmacological research. We note, however, that in the copy received for review pages 657 to 672 inclusive are not in their right place, but have been bound up between pages 640 and 641.

In his little work on the Diagnosis of Acute Sore Throat,[10] which forms part of the series entitled "Médecine et chirurgie pratiques," Professor A. B. MARFAN has two objects in view: first, to show how by clinical examination alone it is possible to decide whether in any case of acute sore throat diphtheria antitoxin should be given at once or not; and, secondly, to revise the nosography of acute sore throat. According to Professor Marfan the groups of symptoms by which the diagnosis of the nature of an acute sore throat is established are in order of importance: first, the appearance of the throat itself; secondly, the associated local phenomena, such as laryngitis, discharge from the nose, and enlargement of the cervical glands; and, thirdly, the degree of constitutional disturbance. Sore throats are divided by the author into red and white according as they are merely catarrhal or show more or less deposit, as in diphtheria, scarlet fever, syphilis, tonsillitis, quinsy, and Vincent's angina. These clinical distinctions are followed by short chapters on the bacteriological diagnosis of acute sore throat.

Salvaging Old Age,[11] by Dr. L. J. MARTIN and Mr. CLARE DE GRUCHY, is a book of wise advice to those who are dreading enforced retirement. Dr. Martin, who is in his eightieth year, began to think on these things when he was 40, and he holds clinics for the benefit of those who do not enjoy their later days. The tragedy of old age is unhappiness, and out of more than two hundred old people studied not more than three could be called even contented. The psychological factors responsible for this unfortunate state of mind are analysed before the consideration of the psychological methods recommended as remedial treatment. The suggestion by relatives, children, and grandchildren that their seniors are senile must be prevented, and the conduct, well meant though it may be, of the young in assuming responsibility for their elders is deleterious. For their sake the old must school themselves in voluntary effort, in observation, and re-education of the memory. Dr. Martin shows that there is plenty of useful work for the old. He himself learnt to drive a motor car and obtained an "operator's licence" when he was 77 years old, and he holds up the more wonderful instance of a man of 96 who did the same in three days.

South America has become more and more important to the business man, the investor, and the traveller, and *The South American Handbook, 1930*[12] edited by H. DAVIES, provides information suited to the requirements of all of these. It claims to put South America in a nutshell, and certainly a vast amount of information has been compressed within its covers. It will interest medical men as investors and travellers rather than in their professional capacity, for it contains no information about the possibilities of practising their craft in these flourishing countries. The fact that the work has reached a seventh edition shows that it is meeting the needs of a great number of readers.

[9] *A Treatise on Materia Medica and Therapeutics, including Pharmacy, Dispensing, Pharmacology, and Administration of Drugs.* By the late Rakhaldas Ghosh. Twelfth edition, by Birendra Nath Ghosh, F.R.F.P. and S. Calcutta: Hilton and Co.; London: H. K. Lewis and Co., Ltd. 1930. (Cr. 8vo, pp. xii + 763. 12s. 6d. net. Rs.7/8, or 12s. 6d.)

[10] *Le diagnostic des angines aiguës.* Par A. B. Marfan. Paris: Masson et Cie. 1929. (5½ × 7¾, pp. 92; 7 figures. 10 fr.)

[11] *Salvaging Old Age.* By Lillien J. Martin and Clare de Gruchy. New York: The Macmillan Company; London: Macmillan and Co., Ltd. 1930. (Cr. 8vo, pp. 173; 8s. 6d.)

[12] *The South American Handbook, 1930.* Edited by H. Davies. Seventh annual edition. London: Trade and Travel Publications. 1930. (4½ × 7, pp. lxxx + 746; illustrated. 2s. 6d.)

PREPARATIONS AND APPLIANCES.

GONORRHOEA IN THE FEMALE CHILD.

DR. HAROLD G. BROADBRIDGE (clinical assistant, genito-urinary department, London Hospital) sends particulars of the following apparatus for use in the treatment of gonorrhoea in female children. He writes:

The cannulae here illustrated were designed to facilitate thorough application of lotions, paints, etc., to the child's urethra and vagina—particularly in gonococcal infections.

The urethral cannula is probe-pointed at one end, while the other end receives a small nipple fitting. When the cannula is in use a piece of narrow rubber tubing eight inches long fitted with a male nipple connects it with a stopcock in the tubing of an ordinary irrigation jar (Fig. 1). The cannula is introduced into the urethra *with the lotion flowing*, and the stream is maintained while the cannula moves gently up and down the urethra. If it is desired to leave some of the lotion in the bladder to be voided later on and so to flush out the urethra (a method often used in adult women) it is only necessary to pass the cannula on into the bladder—the stream of lotion being continuous.

For paints such as solutions of silver nitrate, a 1 c.cm. Record syringe replaces the stopcock in the rubber tubing (Fig. 2). In this case the unattached cannula is passed through the urethra until its probe-point enters the bladder, as shown by the appearance of a few drops of urine at its other end. The cannula is then withdrawn into the urethra just sufficiently to prevent the escape of urine. The syringe, narrow tubing, and nipple are charged with the paint or application, and the nipple is attached to the cannula, which is already in position. As the syringe is slowly emptied the cannula is very gradually drawn along the urethra and out. The syringe must be filled with the narrow tubing attached, as otherwise the solution is simply expelled into the empty rubber tubing and only air reaches the urethra.

FIG. 1.—Large cannula for vaginal douching, and small cannula for urethral irrigation.

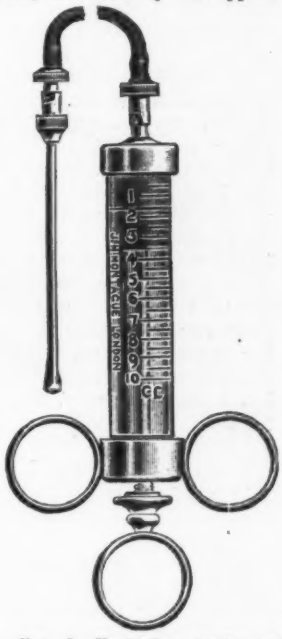

FIG. 3.—Vaginal cannula and syringe for pastes or viscid materials.

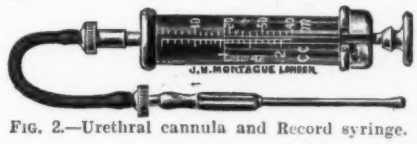

FIG. 2.—Urethral cannula and Record syringe.

The vaginal cannulae are of two varieties: one with a spray nozzle for douching (Fig. 1), and the other with a wide-bore aperture for the introduction into the vaginal fornices of viscid materials—for example, 2 per cent. flavine in glycerin (Fig. 3). This last cannula is connected with a 10 c.cm. syringe by narrow tubing fitted with nipples—the nipples in this case having bayonet catches.

In using these instruments the following facts should be noted: (1) Eight inches of narrow tubing *always* joins the cannula to the supply of lotion. (2) The introducing hand must rest *firmly* against the buttock. Should the child make any unexpected movement, the cannula, narrow tubing, and hand of the operator all move with the buttock, thus avoiding any risk of injury. The passage of these cannulae into the urethra or vagina of a child causes little if any discomfort, and enables a complete antiseptic treatment to be given.

My thanks are due to Mr. Hugh Lett, senior surgeon to the London Hospital and director of the genito-urinary department of the hospital, for kindly allowing this work to be carried on in the department. The instruments are made by Mr. J. H. Montague of Bond Street, W., and may be obtained singly or as a complete outfit.

ROYAL SANITARY INSTITUTE CONGRESS.

THE congress of the Royal Sanitary Institute at Margate, some of the earlier proceedings of which were recorded in our last issue (p. 1182), continued its sessions until June 28th.

Maternal Mortality.

In the Maternity and Child Welfare Section a discussion took place on the latest scientific advances in regard to maternal mortality. Dame LOUISE MCILROY, dealing with the influence of criminal abortion on maternal mortality and morbidity, pointed out how little the medical profession could do to stop the practice, owing to the oath not to reveal the confidences of a patient. The remedies she envisaged were a better moral outlook and a realization of the dangers of abortion and its effect upon life and health. Confidential notification of all cases of abortion would give some idea of the prevalence of the condition, and as all cases of septic abortion were notified already it should not be difficult to obtain notification of every abortion. Another necessary measure was the suppression of all advertisements of drugs sold for the purpose of inducing abortion, no matter how they were labelled.

Mr. C. S. LANE-ROBERTS discussed the scope of prevention in obstetrics and the chief points to be observed in the avoidance of puerperal sepsis, and Dr. LEONARD COLEBROOK followed with a paper on the bacteriological aspects of puerperal fever. He remarked that three years ago he would have said that the issue was narrowed down to one type of streptococcus—namely, the haemolytic variety. But in Germany it had been found that quite a different type of streptococcus must also be taken into account—namely, the anaerobic variety—and he himself was now convinced that his former scepticism was wrong, and that it was necessary to guard against both these dangerous types of organism. Unfortunately the recognition of the anaerobic streptococcus was going to add considerably to the difficulty, because it was not a single well defined type, but a complex group, and several years of research would be required to learn all about the different members of the group.

Training and Employment of Midwives.

In another section Dr. ETHEL CASSIE, chief medical officer for maternity and child welfare, Birmingham, discussed the relations of the midwife with the public health authority, and cited experience in Holland and Denmark, where, she said, midwifery results were greatly in advance of British. It was not only the fact that the midwives were much better trained, nor that every labour was attended by a midwife; it was, above all, that the midwife was recognized by the doctors as the proper person to undertake a normal delivery, while the doctors were trained almost exclusively for abnormal work. Dr. J. E. SPENCE (M.O.H., Eccles) also addressed the congress on the same subject. He pointed out that about 660,000 births occurred annually in England and Wales, of which, under an adequate midwifery service, probably 500,000 would be attended by midwives. He estimated that a whole-time midwife could take 70 cases a year, which would mean that 7,000 midwives were necessary to carry on the service for the whole country. A fresh supply of 1,000 midwives would be required each year to recruit the service. In 1928 the number who entered for the examination of the Central Midwives Board was 2,811, of whom 1,730 were possessed of a general nursing training, and the majority of these nurse-midwives found more attractive and lucrative occupation in nursing than in the midwifery service. The solution of the problem was to make the conditions of service in the midwifery profession more attractive and to improve the remuneration, so that an efficient whole-time service could be built up.

National Health Insurance Medical Service.

In a conference on this subject, Dr. ALFRED COX, Medical Secretary, British Medical Association, spoke on seventeen years' experience of the National Health Insurance Medical Service. He remarked that the common newspaper complaint against the service was to the effect that it was not something which it had never pretended to be. Mr. Lloyd George told the profession at the outset that he was aware that his scheme was incomplete, but that half a loaf was better than no bread, and he proposed to start with a general practitioner service. Nothing much had been added to that foundation, because the scheme had never yet had a really normal year, what with the war, demobilization, disastrous labour disputes, and now phenomenal unemployment. But the system had provided a general practitioner service which, he believed, had been of great benefit to the community, the insured person, and the medical profession, although, like all human institutions, it had its weaknesses. From a study of other national insurance systems, he was sure that the British system worked with greater ease and less complaint on the part of doctors and patients than any other compulsory insurance known to him. The politician, never particularly noticeable in the local administration of the British system, had a sinister influence in many other countries. Some hundred doctors whom he had consulted, and whose practice dated from pre-insurance days, nearly all agreed that the medical service now being given was much superior; all rejoiced in their ability to give a proper service without having to think about the bill; all agreed that insured persons resorted much more freely to the doctor in the early stages of disease, and that the prejudice against the system, very marked in the early days, had almost disappeared. With regard to the effect on the medical profession, the service had enlisted the organized profession as a vital part of its machinery, and thus had provided a valuable training ground in public service. It had caused the tendency to partnership greatly to increase, and had made for a more equitable distribution of the profession. The only serious substitute was a State medical service, which would be devoid of the human touch so necessary in family practice.

The subject of the insurance practitioner was also alluded to in another paper read before the congress by Miss HESTER VINING, who urged the extension of the system to the families of wage-earners, and that the insurance practitioner should undertake complete medical examinations of every member of the family at least three times every year, the results to be carefully recorded.

Hygiene in the Home and in Industry.

Sir FRANCIS GOODENOUGH, presiding over the section which dealt with hygiene in industry, drew attention to some problems of hygienic heating, especially the tendency of builders to erect small houses with one or more rooms unprovided with any flue. This was actually done by some local authorities for the purpose of encouraging the use of electric heaters, but in very many cases the cost of electric heating drove the tenant to buy an oil stove or cheap flueless gas stove, neither of which was satisfactory or even safe, while the electric heater had no ventilating effect, and only created "fug" in a flueless room.

Dr. H. M. VERNON of the Industrial Research Board spoke on methods of investigating and improving the health of industrial workers, and mentioned that a scheme was under consideration for a compulsory periodical medical examination of all workers engaged in the trades which involved the inhalation of silica-containing dust.

Dr. MILLAIS CULPIN, in a very interesting paper, described some occupational neuroses, and remarked on the erratic character of the sickness rates in different industrial establishments. He mentioned one large manufacturing firm with excellent welfare arrangements and its own medical staff, which had one of the highest sickness rates encountered—up to 16.48 days for females over 22—and of this high sick rate, 14.9 per cent. was due to dysmenorrhoea. On the other hand, a large retail store, where about half the staff were females, had a sickness rate of only 2.6 days, and of this only 1/2 to 1 per cent. was due to dysmenorrhoea. It was a curious contrast, for which he defied the gynaecologists to supply a satisfactory reason. Dr. Culpin dwelt on other troubles which were purely mental phenomena—by which he did not imply that the sufferers were malingerers—and in the same group he placed other common causes of absenteeism, such as gastritis, neuritis, or influenzal debility, with the reservation that cases of physical illness did occur under those designations.

Many of the other papers read to the congress had an interest from the medical point of view, including one by Dr. STELLA CHURCHILL, on a critical examination of child welfare schemes; one by Sir JOHN ROBERTSON, on the slum problem; and one by Colonel L. W. HARRISON, on venereal diseases in the mercantile marine. In addition, there were many papers on sanitary engineering and inspection, veterinary science, and the hygiene of food.

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SATURDAY, JULY 5TH, 1930.

THE SIMON REPORT AND THE MEDICAL SERVICES OF INDIA.

THE publication of volume ii of the Simon Commission's report, briefly referred to in our last issue, makes it possible to consider the probable effect on the medical services of India in the event of the adoption of the Commissioners' unanimous recommendations on this subject. In doing so, however, we must not be thought to forget that the problem of the Indian Medical Service is part of a far wider whole, and that its satisfactory solution is contingent upon the form and spirit of the settlement towards which the recommendations of the Simon Commission, important as they are, constitute but a preliminary step. If we were in danger of forgetting, perusal of the 700 pages of the two volumes of the report, which devotes a few paragraphs only to medical services, would correct the tendency. Further, we believe that the medical needs of the people of India, as of other countries, can best be met in the long run by the development of a strong independent medical profession, contributing its due quota to every branch of medicine, including the public services. If, therefore, we emphasize the importance of recommendations designed primarily to maintaining or enhancing the attractions of the Indian Medical Service for British recruits, it is because, in common with the Lee Commission and the Simon Commission, we regard the I.M.S. as a key service in more than one sense, and the maintenance of a highly qualified European element in that service, for the present at least, as vital to the end which all parties should have in view. We agree with the statements in the first volume of the report that "failure in recruitment of the Indian Medical Service would be a serious matter for india"; and that "the public health of India would pay a heavy price" for any failure to continue to recruit the best type of research worker "with the exceptional standards and traditions of the Indian Medical Service," who cannot be obtained provincially. And we look to the members of that service, Indian and European, to supply in the not too distant future "the need in all but the best hospitals for raising the standards of medical treatment," with regard to which the Commissioners state that nothing impressed them more in their journeys through India. As the Army in India will be placed directly under the Governor-General and the Commander-in-Chief, independently of the Central Legislature, both the R.A.M.C. officers and the military branch of the I.M.S. should be adequately safeguarded under the new constitution. The civil side of the Indian Medical Service, however, still forms its main attraction to recruits, for in spite of the considerable reduction during the past decade in the number of civil posts reserved for the I.M.S., those remaining afford on the average greater scope than formerly for well-qualified keen officers; and, now that the professional opportunities on the military side have been greatly enhanced through the provision of good equipment of the hospitals and specialist appointments under the station hospital system, it is at least as easy as in former times for suitably qualified I.M.S. officers to obtain attractive civil appointments. The extracts from the first volume of the report which were published on June 21st in this *Journal* sufficed to show that the Commissioners regard the maintenance of the attractions of the civil side of the medical service as essential to the welfare of India.

The striking tribute paid to the work of the Indian Medical Service in the first volume has naturally led the Simon Commission to the important conclusion that the present position, which resulted from the report of the Lee Commission, should be maintained intact to allow of the supply of an adequate reserve of European officers for military purposes, and to implement the pledge of the Government of India to provide European medical attendance for the officers of other services and their families, without which the Commissioners rightly judge that the recruitment of Europeans in all departments, so essential to the progress of India, would fail. Their main recommendation in paragraph 333 of volume ii under the heading Medical Treatment for European Officers therefore reads: "European officers of the services lay great stress on the continued provision for themselves and their families of medical treatment by European doctors. We regard this as essential; no change should be made in the present Devolution Rule 12, which gives the Secretary of State in Council power to prescribe the number of Indian Medical Service officers to be employed in the provinces, and the appointments and conditions upon which they shall be employed; and no effort should be spared to secure an adequate number of European recruits for the Indian Medical Service to implement this fundamental obligation." Moreover, in the next paragraph, on recruitment for the All-India services (which, of course, include the I.M.S.) they state: "It is certain that the European recruits of the capacity and character required can only be obtained on terms which give them, subject to the exception mentioned below, the same rights, privileges, and safeguards as we have recommended for the present members of the services." The exception is the unlimited right of early retirement on proportionate pension, which is, however, qualified by powers granted to the Secretary of State for India to safeguard all officers in this respect. This exception, moreover, scarcely applies to officers of the I.M.S., who already possess the right to retire on gratuities after six and twelve years' service, and who obtain yearly increments of pension from seventeen years' service onwards.

Speedy adoption of the unanimous recommendations of the Commission should therefore suffice to safeguard the position attained by the Indian Medical Service under the reorganization scheme of 1928, and the further concessions granted in 1929 through the good offices of the British Medical Association, on the strength of which a very fair recruitment has been obtained for the service during the last two years, and to restore confidence in the future of the service. Meanwhile we fear that the inevitable interval of uncertainty must tend to handicap recruitment at a time when there is a good deal of leeway to be made up owing to the practical cessation of recruiting for several years before the reorganization scheme was sanctioned. Such uncertainty is, however, unavoidable in the circumstances, and we may hope that the unanimous recommendations of the Commission in respect to the medical services will be confirmed by the Secretary of State for India with the least possible delay in some such authoritative announcement as the Commissioners themselves seem to contemplate in the statement on page 293 of volume ii: "We presume that as soon as

possible after the new constitution is settled a full explanation of the changes involved, and their implications for the services, will be made public, and that every possible step will be taken to ensure that prospective candidates are fully informed of the conditions under which they will serve."

HEPATITIS IN BILIARY DISEASE.

IN an article recently published in this *Journal* Mr. E. R. Flint[1] discussed the difficult question of the association of inflammatory changes in the liver (hepatitis) with disease of the biliary tract. This is a problem which greatly interests the physician, but it is the surgeon who has the best opportunities of investigating the data. Animal experiments, which must of necessity deal with comparatively acute conditions, are of little assistance, since the associated changes in the liver and biliary tract are of a chronic type requiring much time for their development. Evarts Graham, the discoverer of the well-known method of cholecystography, was one of the first to bring the problem before us, in his paper entitled "Hepatitis, a constant accompaniment of cholecystitis."[2] His views are further elaborated in his textbook[3] published in association with his colleagues Cole, Copher, and Moore. Graham propounded the question of how the hepatitis may arise. Which is the primary lesion—hepatitis due to microbic infection followed by cholangitis and cholecystitis, or primary infection of the biliary tract with subsequent hepatitis resulting from lymphatic absorption? Following Graham's work, the subject has attracted the attention of other surgeons, such as Judd[4] and Moynihan.[5] It has also become recognized that the cystic lymphatic gland is infected with micro-organisms very early in gall-bladder disease (Wilkie and others), and this has been taken as evidence in favour of primary biliary infection with secondary lymphatic spread to the liver. In reality the cystic gland involvement only proves lymphatic absorption, but does not disprove in any way the view held by some that the primary lesion is hepatic, the gall-bladder infection secondary, and the cystic gland infection tertiary.

An important contribution to the subject, wider in its scope than most of the papers referred to, is the book of the Beaumont Foundation Lectures, published by Heyd, Killian, and MacNeal in 1924.[6] Their work takes into consideration the effects of chronic infective abdominal disease in an area outside the biliary tract—namely, the appendix. The inquiry might well be extended in future by the surgeons to the effects of chronic infections of other organs draining blood into the portal system—for example, the pancreas, the spleen, and the large and small intestine. Heyd, Killian, and MacNeal examined in a variety of ways the appendix, gall-bladder, and portions of liver removed at the same operation in a series of patients. Hepatitis they found to be common enough when the appendix alone was diseased, due presumably to organisms or toxins spreading directly into the portal blood. They noted, however, that the hepatitis of chronic appendicitis involved only the superficial layers of the liver, just below Glisson's capsule. Disease of the biliary tract, in their experience, led to a much more generalized hepatitis throughout the liver tissue, extending far away from the neighbourhood of the gall-bladder, and they were disposed to favour the view of continued lymphatic absorption from the gall-bladder as the cause of the hepatitis. Flint has taken up the subject afresh, and has carefully studied thirty-four cases. His results are particularly interesting in that he has applied, in addition to the usual bacteriological and histological methods of investigation, two tests of hepatic function—the van den Bergh reaction and the laevulose tolerance test—to his cases. It is in a way unfortunate, in view of the observations by Heyd, Killian, and MacNeal on the hepatitis associated with chronic appendicitis, that Flint has used as "controls" patients with appendicitis and gastric, duodenal, and jejunal ulcer, all lesions draining the portal venous bed.

It is much to be desired that Flint and others will continue to investigate this problem, for it concerns what may prove to be one of the most important causes of partial hepatic insufficiency, and of permanent ill health from interference with the function of the principal "laboratory" in the human body.

[1] Flint: *British Medical Journal*, 1930, i, 1041.
[2] Graham, Evarts A.: *Surg., Gynecol. and Obstet.*, 1918, 26, 521.
[3] Graham, E. A., and others: *Diseases of the Gall Bladder and Bile Ducts*. 1928, Lea and Febiger, Philadelphia.
[4] Judd, E. S.: *Journ. Amer. Med. Assoc.*, 1921, 77, 197.
[5] Moynihan: *British Medical Journal*, 1928, i, 1.
[6] Heyd, C. G., Killian, J. A., and MacNeal, W. J.: *The Liver and its Relation to Chronic Abdominal Infection*. Beaumont Foundation Lectures, 1924. London, Henry Kimpton.

STERILIZATION OF THE UNFIT.

SOME months ago the Central Association for Mental Welfare asked the Government to appoint a Royal Commission "to make full inquiries into the causation of mental deficiency, into its relationship to other abnormal conditions and social problems, and into any measures, including both segregation and sterilization, by which it might be prevented." The Council of the British Medical Association endorsed this suggestion with the proviso that any suitable body other than a Royal Commission might be accepted for the purpose of the inquiry. The Minister of Health, however, expressed the opinion that the proposal was not yet opportune, but said that the question might well be reopened at some more favourable time. It is probable that this will be done in the not very distant future. Meanwhile, as is proper and desirable, the discussion on these matters continues, and a useful contribution to this discussion is made by Dr. Frank A. Gill, medical superintendent of the Calderstones Institution for Mental Defectives, in his report to the Lancashire Asylums Board, under whose control that institution is conducted. The essential thing in any controversy about the effect of sterilization is to distinguish carefully between the various purposes for which it may be advocated. That it may be an appropriate measure in individual cases for personal or family reasons is scarcely in dispute as regards its medical or scientific aspects. This being admitted, the questions at issue are: (1) whether it is of sufficient value to be adopted as a routine measure in selected cases of mental deficiency and of recurrent insanity so that a larger number of such cases may be properly released from institutional care; and (2) whether it is of any practical value as a eugenic measure for the betterment of the race. It is one of the merits of Dr. Gill's report that he distinguishes between these two questions, though even here there is occasional confusion. He admits, even emphasizes, the futility of sterilization for the latter purpose. "The fallacy of this claim of wholesale sterilization lies in the fact—and it is a fact—that the great majority of certifiable defectives are not the progeny of mentally defective parents, but of apparently normal or subnormal yet more or less self-supporting citizens, whom no sterilization laws could touch or seek to touch. The majority of victims of mental infirmity come of families who are the subject of some mental instability; whose germ cells are in some way faulty, and who may only be carriers of defect without themselves exhibiting any trace. If every certifiable mental defective had been sterilized twenty or thirty

years ago it would have made little appreciable difference to the number of defectives existing to-day." As we have previously said on more than one occasion, it is clear that in order to produce any practical effect as a eugenic measure sterilization would have to be applied to a proportion of the population which would certainly not be less than one-tenth of the whole. While, however, Dr. Gill concludes that "a policy of wholesale sterilization of the mentally unfit is neither necessary nor desirable," he maintains that it is desirable in the recurrent insane, in certifiable women who become pregnant or are immoral, and in selected cases before release from institutions. There is undoubtedly a strong case for this contention, though the extent to which institutional provision would be relieved by such measures is open to grave doubt. If future discussion could be kept on these lines and directed to this thesis much would be gained. This will be difficult of attainment, for Dr. Gill certainly underrates the extent to which public opinion, even intelligent public opinion, is misdirected in this matter—even by certain persons and societies who might be expected to know better. Dr. Gill mentions the argument brought forward by opponents of sterilization "that public opinion may seize on sterilization as a cheap and economic remedy for dealing with the problem of the unfit, and so cease to make adequate provision in the way of institutions and hospitals," but is satisfied that if the problem is properly understood these arguments may be dismissed as futile. But is it futile to point out the dangerous situation that may arise if the public accepts the view that sterilization can be an effective substitute for segregation, and that it can be adopted as a measure by which mental defect can be racially eradicated cheaply and relatively quickly? It is important to bear in mind that the campaign in favour of sterilization is at present being mainly carried on by these arguments, the fallacies of which have been exposed over and over again.

THE FOOT AND THE SHOE.

IN an article with this heading in our issue of October 12th, 1929 (p. 678), we commented not very hopefully on the difficulty of persuading wearers of shoes to abandon harmful fashions in their own interests. In glancing at the history of footgear we dwelt chiefly on the form of the shoe, and on the pointed toes and high heels preferred by most women. We scarcely touched on the materials used by shoemakers. Nevertheless, the substances used in making all parts of the shoe are not without their importance. This aspect of the matter has lately been considered by the Incorporated National Federation of Boot Trades' Associations, Limited, the general secretary of which has sent us some account of an analysis of the answers to a questionary which was recently sent to two hundred medical officers of health. Anything which affects the health of the individual must in the long run collectively affect the public health, so that from a general point of view no doubt the federation was well advised to consult medical officers of health. We question, however, whether those officials see as much of the evil effects of improper footgear as do general practitioners and orthopaedic surgeons. We take it that the federation does not aspire to add to the sanitary duties of the Ministry of Health the regulation of the people's boots and shoes. Legislation of that kind has been carried out in other days and in various countries, but such sumptuary laws have generally failed to attain their object. King Charles V of France attempted to regulate the length of the pointed "poulaine" shoe according to the social status of its wearer, but the fashion only ceased when the swing of the pendulum brought in the broad-toed Tudor shoe, which in its turn soon went out of fashion. We do not envy the task of the medical officer of health and his inspectors who might be charged with the duty of dictating to the women of the present or a future day what kind of shoes they should wear, or what materials those shoes should be made of. The questionary of the federation has not brought to light any very startling or new facts. Somewhat sweeping statements are made about the extent to which the general health is affected by footwear. The recommendations that "boot and shoe makers should scrap present-day lasts in order to do away with shoes of unnatural shape and pointed toes," and that "ultra-high heels should go," seem to us counsels of perfection, unless the regulation could be enforced throughout the world. If British boot makers refused to supply "fashionable" shoes, the import from the Continent and America would become enormous. The "perfect" boot or shoe, according to this report, would lessen "the ill effects on national health of rheumatism, chest troubles, heart disease, common colds, foot deformities, fallen arches, and flat feet." As to the three last there can be little doubt, but the influence of shoes on the other disorders is more problematical, although we are told that "55 per cent. of the doctors said that these ailments and many others are due to the wearing of defective and unsuitable footwear." One medical officer of health is credited with the suggestion that "models or casts of feet from Greek statues, such as the Venus de Milo, giving size and shape would encourage less foolish women to buy shoes of correct shape and size." This officer is evidently an optimist. As to materials, the federation and the doctors are agreed that "there's nothing like leather." Such statements as the above, in the nature of things, are only the outcome of general impressions, lacking any precise statistical foundation. The medical officers of health were on firmer ground in denouncing high heels and pointed toes, but neither the questioned nor their questioners make any practical suggestion as to how the female public is to be persuaded to reform its ways in the choice of its footgear. Appeals to reason and common sense have hitherto fallen, and are likely to continue to fall, on deaf ears. Nothing less than a change of heart could effect the necessary reform, and to bring that about a sutorial Wesley is urgently needed who should be the apostle of broad toes and should finally extirpate the digitigrade heresy.

THE ROYAL SOCIETY CONVERSAZICNE.

THOSE who attend the conversaziones of the Royal Society have learned not to be surprised at finding side by side in the same room—as they did last week—corals from the sea bottom, photographs of a new planet, relics of prehistoric man, and a new device in gramophone recording equipment whereby at intervals the scientific atmosphere vibrated to the latest music-hall tunes; or, again, such exhibits, shown in contiguity, as specimens of ancient art excavated at Ur of the Chaldees, a new *x*-ray tube by Mr. Cuthbert Andrews, said to be the only tube of British manufacture which incorporates its own protection (a protection equivalent to about 3½ mm. of lead), and a display from the Natural History Museum illustrating parasitization in the case of certain Nigerian frogs whose eyes and lacrymal glands harbour clusters of oligochaete worms. Among the many things that caught the eye was an electrical model for showing normal and abnormal heart rhythm with the aid of relaxation oscillations produced by neon tubes. This model, the work of Dr. van der Pol, and shown by Philips Lamps Ltd., consisted of threo neon relaxation oscillators, representing sinus, auricles, and ventricles, and by variations of coupling (representing the bundle of His) normal rhythm or partial or complete heart-block could be obtained, with electro-cardiograms of the various movements. The National Institute of Medical Research had an exhibit illustrating a hitherto undescribed virus disease of mice. The disease is recognized by the occurrence of swelling, usually of one hind foot, followed by gangrene and

separation of the affected portion of the limb. This has been found to be due to a virus which, under certain conditions, constantly passes through filters which hold back bacteria. Dr. R. Robison of the Lister Institute, with Dr. H. B. Fell, showed specimens indicating the development *in vitro* of the mandibular skeletal tissue and limb periosteum of the embryonic fowl; and Mr. C. H. Waddington experiments (also shown by Dr. Canti on his film) on the living embryo which had been removed from the chicken's egg soon after it was laid, and allowed to continue its differentiation *in vitro*. From the Strangeways Research Laboratory, Cambridge, again came an exhibit of the effects of *x* rays on tissues growing *in vitro* and *in vivo*. The cast of the Peking skull (*Sinanthropus pekinensis*), shown by Professor G. Elliot Smith, claimed the largest share of attention. This brain case was found in December last by the Geological Survey of China, at a spot some forty miles from the Chinese capital. It was described by Professor Elliot Smith as probably the most significant cranium of early man ever discovered. It comes from a geographical area which hitherto has revealed no trace of ancient man. The skull shows features some of which were unknown hitherto except in *Pithecanthropus*, and others only in the Piltdown skull. The *Sinanthropus* is a link between these two types, and brings into correlation what hitherto have been the irreconcilable contrasts which separate them one from the other. The value of the skull, according to Professor Elliot Smith, is that it gives cohesion to the knowledge of the earliest human remains, and makes it possible to conceive the qualities of the common ancestor of all three types—in other words, the nature of the, as yet, undiscovered Pliocene man. The Peking skull was found, not in gravels, but in the floor of a cave where the primitive man actually lived, and was in an uncrushed state and in more complete form than previous discoveries, thus giving a more convincing idea of the shape of the primitive brain case and more confidence in the essential accuracy of the reconstruction of the Piltdown skull by Dr. Smith Woodward in 1912. The temporal bone of the Peking skull presents features of quite exceptional interest and importance. It is very much more primitive than that of the Piltdown skull, and its general morphology presents a striking resemblance to the condition of the adult anthropoid apes. Professor Elliot Smith also showed a cast of the first lower molar tooth found in October, 1927, at the same place, the Lower Pleistocene cave-deposit, as that in which the skull was subsequently discovered. On the evidence of this tooth Professor Davidson Black postulated a new genus and species, *Sinanthropus pekinensis*, the justification for the new genus being based partly upon the unique morphological characters of the tooth, the fact that its proportions differed from all known human and simian teeth and occupied a position intermediate between them, and also the remote antiquity of the tooth, indicated by the geological evidence, which assigned it to the Lower Pleistocene. The discovery of the tooth was followed a year later by the discovery of fragments of two jaws, and later still, six months ago, of the brain case.

THE ORGANIZATION OF RHEUMATISM CLINICS.

Now that several new clinics for the prevention and treatment of rheumatic diseases are beginning their attack on these crippling disorders, it is well to consider the best way in which the work can be done. Dr. R. Fortescue Fox, in a recent number of the *Acta Rheumatologia*,[1] points out that the great enterprise now being undertaken is largely experimental. The difficulty is, he says, that the workers are using unfamiliar tools for a job that they do not understand, and out of his forty years' experience in this subject he suggests certain lines of investigation for the rheumatic cases. The important subject of causation can be studied particularly well at the new clinics, where early and chronic cases will be under continuous observation. In Dr. Fox's opinion there are four factors which should especially be investigated: external conditions, constitutional anomaly, infection, and the skin. Under the first heading come geographical and climatic incidence, housing, and occupation. In addition to records collected by medical officers of the rheumatism clinics, it is suggested that some of the national societies for the study of rheumatism should organize inquiries on a wide scale and furnish returns. The question of the constitutional anomaly is especially one for the medical officer at a clinic who is in a good position to investigate the difficult subjects of "hereditary predisposition" or "familial tendency." As Dr. Fox remarks, such observations are difficult to record in a precise and statistical form, yet the longer the experience of the physician the more familiar he becomes with the importance of constitutional factors. With regard to infection, the problem which calls for elucidation is whether organisms found in the search for possible foci are really operative or inoperative as infective agents, and, further, how to deal with organisms within the body. The fourth factor, the skin, in Dr. Fox's opinion, stands more in need of study in its relation to organs and its functional condition in chronic disease than any other medical topic. Some suggested lines of inquiry for the student of rheumatism include systematic mapping out of skin temperatures, both of exposed and of covered parts. Cold areas of skin are very common in chronic diseases, and what is needed is accurate observation by rapidly acting surface thermometers. The degree to which perspiration is in abeyance, temporarily or permanently, also requires investigation in rheumatic disorders, and further details are needed about the peripheral circulation. Dr. Fox finally urges that all statistical records by national societies should be expressed in the terms proposed for provisional use by the British Ministry of Health. He deplores the current tendency to premature definition which may easily confuse the issue. As a temporary expedient he believes that classification on a basis of age-groups is the best to be followed. Alternatively a therapeutic classification offers interesting possibilities, for if one hundred cases of arthritis were submitted to the same treatment they could be usefully classified according to the reactions manifested. "Only the physician at the bath side can properly recognize and interpret the complex physiological reactions to treatment." Dr. Fox's forty years' experience at the bath side warrant a close study of all his suggestions.

[1] *Acta Rheumatologia*. No. 5.

THE PRICE OF RADIUM.

In his recent presidential address to the Institution of Mining and Metallurgy, Professor J. G. Lawn referred to radium as affording the most striking example of high price in the whole history of metals. It is now worth approximately £14,500 a gram. There are 31.1 grams in the ounce troy, so that the value of radium is more than a hundred thousand times its weight in gold, and a ton at this price represents nearly twice the national debt. Professor Lawn added that radium had such valuable properties that in spite of its price there was a trade in it on a very small scale, the sales in 1928 amounting to some forty grams. The only consolation to be derived from Professor Lawn's figures is that the price, high as it is, is little more than half what it was during the war. In pre-war times the price of radium, obtained from Austria, was anything from £16,000 to £32,000 a gram. Then, for several years, it was produced on a fairly large scale in the United States from carnotite. During the war the price reached £25,000, and occasionally £27,000, afterwards becoming stabilized at £24,000, except for occasional sales of large quantities at a lower figure. Later, with the discovery of new sources of high-grade radium ore in the

Belgian Congo, the cost of production was lowered to a price with which American carnotite could hardly compete, and the price was reduced from £24,000 to about its present level. Professor Lawn stated that radium is fairly widely distributed, and most countries possess ores which carry it, but it occurs in such minute quantities that there seems little hope that it may be produced on a larger scale or at a cheaper rate than at present.

THE BRETTAUER COLLECTION OF MEDALS.

THE University of Vienna is in possession of a large and important collection of medical medals—"Medicina in Nummis"—presented by the well-known research scholar Dr. Josef Brettauer of Trieste, who died in 1905. The collection comprises some 7,000 medals, among which there are many artistic and historical works of value, representing Renaissance, Baroque, and modern art. It covers a wide field, and offers material of great interest to the student of medical history. There are three main groups. The first concerns physicians of all times and nations, the second epidemics (especially plague, small-pox, cholera) and famines. The third group comprises, in many subdivisions, medals referring to healing gods and patrons of medicine, hospitals and welfare institutions, medical corporations and congresses, nursing and ambulance, nearly all special branches of medicine and the medical auxiliary sciences, pharmacy and veterinary science, etc., besides amulets, tokens, and satirical medals. The control of this precious collection was recently transferred to the Medal Cabinet of the Vienna Art-History Museum. In accordance with the regulations of the foundation deed a small selection is exhibited to public view, while the remainder, housed in the exhibition room of the federal collection of medals, coins, and money-tokens, is open to all interested in this branch of science. The publication of a scientific catalogue of the Brettauer Collection, with photographs and drawings of medals of special historical importance, is most desirable, but the cost of this cannot be covered altogether by a donation from the Austrian Government. An appeal is therefore made on behalf of the committee by Professor Max Neuburger, president of the Institute of Medical History, and others, to all friends of science and art, and especially to medical historians and numismatists, and to medical faculties, associations, and societies, to send contributions to the office of the Rector of Vienna University. A list of donors will be published in an appendix to the catalogue.

MR. J. C. GARNER.

OLD contributors to these columns, who have good reason to appreciate his worth, will regret to learn of the retirement of Mr. J. C. Garner after more than twenty-six years as head reader on the staff of the *British Medical Journal*. When he entered our printing office in 1904 Mr. Garner had already had long experience in the preparation of medical papers for the press, and Sir Dawson Williams laid upon him the duty, under Mr. Louis Taylor's immediate supervision, of bringing the typographical practice of the *Journal* up to the highest standard. To them and to their successors he has given loyal and unstinted service, counting no effort too great in the maintenance of accuracy and good form in printing, and the right use of scientific terms. His work was not confined to proof correcting, but included the revision of copy. Few medical writers and very few readers recognize their debt to such men, under whose expert hands a slovenly MS. takes presentable shape, and a rough and undigested mass of figures and obscure symbols emerges as a clear and well-balanced table. "It looks better in print than I expected," says the author, dimly aware that something has been done for him; and with this faint approval the skilled and conscientious worker in the background is usually content, his true reward being the knowledge that one more piece of work that matters has been done as it should be done. In taking leave of Mr. Garner we offer him the gratitude due to a good and faithful servant of the British Medical Association and its *Journal*.

THE Lister Memorial Lecture before the Royal College of Surgeons of England will be delivered at the College, Lincoln's Inn Fields, W.C., by Dr. Harvey Cushing, professor of surgery, Harvard Medical School, on Wednesday, July 9th, at 5 p.m. The subject of the oration will be "Neuro-hypophysial mechanisms from a clinical standpoint."

ROYAL SOCIETY OF MEDICINE.

ANNUAL GENERAL MEETING.

THE annual general meeting of the Royal Society of Medicine took place on July 1st, with LORD DAWSON OF PENN in the chair.

The first business was to elect officers and council for the session 1930–31. A motion by Dr. PEACHEY to adjourn the meeting for fourteen days on the ground that, as he alleged, there had been some irregularity in regard to the suspension of the nominations in the library as required by the by-laws, was negatived, but the president promised that the procedure of nomination of officers and council should be reviewed by a committee when the new session started in October. No counter nominations had been received to those set out in the notice, and accordingly the following were declared elected:

President: Dr. T. Watts Eden.
Treasurers: Dr. A. M. H. Gray and Mr. W. Girling Ball.
Hon. Secretaries: Mr. E. K. Martin and Dr. George Riddoch.
Hon. Librarians: Dr. William Bulloch and Mr. H. W. Carson.
Hon. Editors: Dr. Hugh Thursfield, and Mr. J. Swift Joly.
Council: Sir John Bland-Sutton, Mr. Zachary Cope, Dr. F. R. Fraser, Mr. Sampson Handley, Dr. Dorothy C. Hare, Sir Stanley Hewett, Mr. Hugh Lett, Mr. Warren Low, Lord Moynihan of Leeds, Dr. Bernard Myers, Dr. A. E. Russell, Sir StClair Thomson, Sir John Thomson-Walker, Dr. H. Letheby Tidy, and Dr. G. de Bec Turtle.

The report of the council for the last session was submitted. It stated that the roll of the Society included 39 Honorary Fellows, 4,047 Fellows, 198 corresponding members, 378 members of Sections, and 64 associates; the use of the Society's house by the Fellows was now greater than ever, and the time was approaching when an additional meeting room would be needed, which it was hoped to secure by building a top story. The accounts revealed a total income of £21,125 and a total expenditure of £20,025. Through the kind offices of the president, the Society received during the year a sum of £2,800 from Mr. Stanley Baldwin, allocated at the time he was Prime Minister, from a fund placed at his disposal by Lord Beaverbrook. This gift is the subject of a special trust, which will be administered by a specially appointed committee. The income is to be used for purposes for which the general funds of the Society would not ordinarily be available. The Society has also received from Lady Singer £500 in memory of the late Sir David Ferrier.

Sir JOHN THOMSON-WALKER, in moving a vote of thanks to Lord Dawson of Penn, said that it had been a wonder to him how, with so many calls on his time, he had found energy to take the interest which he had done in the Society. Lord Dawson had shown endless tact, great firmness, and an anxiety to see the Society make progress.

LORD DAWSON, in response, said that to have been president was a great privilege, and the privilege had been rendered a delight by the consistent support and encouragement he had received from his colleagues on the council and the executive officers. No man could aspire to a higher honour than to be president of the Society, which gathered together a greater number of co-ordinated activities than any other institution in the country. He handed on his office to a colleague (Dr. Watts Eden) distinguished the world over in the specialty to which he belonged and known for his progressive mind and wise counsel.

RESEARCH IN ANIMAL GENETICS.*

BY

SIR EDWARD SHARPEY-SCHAFER, F.R.S., P.R.S.E.,

PROFESSOR OF PHYSIOLOGY, UNIVERSITY OF EDINBURGH.

THE Animal Breeding Research Department at Edinburgh was established some ten years back to investigate the principles which should govern the breeding of animals employed in agriculture. The first step was to select someone to carry out and direct research on the subject—no easy task, and our choice was fortunately fixed on the present director, Professor F. A. E. Crew, who had already made a name for himself as an authority on genetics. As a result the department has already become an unqualified success, not only in the objective sense, as manifested by the buildings we are assembled to inaugurate, but much more in the personnel which the director has been able to gather round him, and in the work they have already effected.

Research Problems in Animal Breeding.

It might be thought that as the department was established for the encouragement of agriculture, and that the avowed object was to improve the breeds of animals used for agricultural purposes, the choice of a director would have fallen upon an agriculturist accustomed to the breeding of stock, who would surely have been best able to judge what results were required and how these could be arrived at. Those who hold this opinion would consider that in appointing a purely scientific man, with little or no experience in the breeding of farm animals, the committee made an initial mistake. But the breeding of animals, like all applied sciences, must be founded upon a basis of pure science. Moreover, it is essential that it should, like every other branch of science, be based upon experiment. Now it would be possible for experiments in breeding to be carried out on ordinary farm animals with a certain amount of success. But the length of time one has to wait for the result of experiment in animals which have a gestation period of many months greatly limits the number of experiments which can be made, and renders the progress of research very slow; moreover, from the interbreeding which has been going on for long periods in most domestic animals, the results may be uncertain. As a concrete example we may cite the Penycuik experiments on telegony by Professor Cossar Ewart. By telegony is meant the influence exercised upon the mother by the foetus *in utero*. Not long ago every breeder in the country believed that if a female of pure breed was crossed by a male of the same species, but of another breed or of no breed at all, the resulting progeny would so influence the maternal organism that this particular female would never again—even if crossed by a male of exactly the same breed—produce pure progeny; that, for example, a mare of the purest blood would be permanently ruined for stud purposes if she were in foal to a stallion which had no pedigree behind him. The circumstance was thought to be proved by the observation of Lord Morton, communicated to the Royal Society in 1820, that a mare which had produced a hybrid foal to a quagga—a species of zebra—and was afterwards crossed by an Arabian horse, happened to produce a foal which exhibited distinct stripes: these stripes were supposed to have been caused by an influence exercised upon the mother by the hybrid foal *in utero*. The question of telegony was, however, definitely settled in the negative, so far as the equidae are concerned, by Professor Ewart, who crossed mares, first with zebra stallions, producing hybrids which showed distinct stripes, and subsequently with ordinary horse stallions. The progeny of the second crossing never showed signs of the zebra influence, although faint stripings were sometimes visible in the foals, but not more than in ordinary foals, in which stripings are sometimes noticeable—an indication that the horse had at one time a striped ancestor.

These experiments took years to bring to a conclusion and cost hundreds of pounds; but similar experimental results can be obtained in a comparatively short time by selecting small animals with short periods of gestation. Nor is it necessary to employ mammals alone for such experiments. For many purposes birds are even better adapted. And as the experiments of T. H. Morgan and others have shown, the laws which govern heredity and the morphological conditions which accompany and determine the transmission of bodily characters may be even more advantageously studied in certain invertebrate types, such as drosophila. Nor are these laws essentially different in the animal and vegetable kingdoms. The law of heredity discovered by Mendel was the result of experiments upon crossing varieties of sweet peas. And of late years a vast amount of work of the same kind has been carried out on different kinds of plants, which in some particulars lend themselves even better than animals to the elucidation of the principles governing heredity. It may be added that these experiments illustrate the fallacy of the saying "Natura non facit saltus." Rather would it seem that nature frequently does work by leaps, and that intermittence is often the rule, continuousness the exception.

Application of Genetics to Man.

Just as the principles of genetics are applicable to plants as well as to animals, can they equally well be applied to man. I suppose that nowadays all educated persons admit that mankind is only the highest type of animal; and therefore that all laws which regulate the lives of animals, including those which determine heredity, apply equally to him. If we were able to use the knowledge acquired in breeding animals for the improvement of our own race, we might eventually succeed in eliminating much that tends to keep the race physically and mentally far lower than is desirable. At present all that we can do is to educate the individual. Much, no doubt, can be effected in this way, but education is useless unless there is an inherent power to be educated.

But civilization has not progressed enough to permit even an endeavour to promote amelioration of the race by breeding from the highest types. All that seems possible is the prevention of breeding from the lowest types. Unfortunately there is a grave risk of an inferior type becoming established, for it happens that the reproductive faculties are better developed in mentally inferior than in superior types. It is the object of eugenics to combat this downward tendency of the race, though how this predominance of the unfit can be prevented is a difficult and controversial problem. It is, however, a problem which urgently demands solution, since the future welfare of the human race hinges upon it.

Study of Sex Hormones.

The study of animal genetics depends in the main upon physiology: probably that is the chief reason why I have been asked here to-day. Particularly it concerns the physiology of the sex cells and the organs in which these are produced. The sex cells are not the only elements produced by the gonads. Both in the male and in the female there are other cells which exert a profound influence upon the organism. This influence is the chief cause of what may be termed "maleness" or "femaleness," these qualities showing themselves not only in the physical features characteristic of the respective sexes, but also in the psychical attitudes which are equally sex-distinctive. One of the most interesting advances in the science of genetics has been to prove that these so-called secondary sex characters—whether corporeal or psychical—are dependent, not on the sex cells themselves, but on the other cells just mentioned. These other cells, however, do not exert their influence directly, or even through the nervous system, but they manufacture specific chemical substances which are passed into the blood and, circulating throughout the organism, are brought into contact with every cell in the body. These chemical substances belong to the class known as autacoids; they either stimulate activity (hormones) or restrain activity (chalones). They are of relatively simple composition; some have been obtained in a crystalline form. The

* From an address at the opening of the Department of Research in Animal Genetics, University of Edinburgh, on June 30th, 1930.

administration of extracts of the gonads to immature animals (or to animals deprived of their gonads) is followed by the development of the special secondary sex features, both physical and psychical, characteristic of the sex from which the extract has been obtained. The substances in question are zoologically non-specific; in other words, it matters not how different the species of animal from which they have been obtained, the same results are yielded as if they had been derived from an animal of the same species as that to which they are administered. From this is it clear that genetics involves the study not merely of the structure and functions of the sex organs, but also that of their chemical products; this branch of the subject is increasing in importance every day.

Genetics has, however, not merely to do with the activities of the sex organs themselves; it is concerned also with the effect upon them of the nervous system and of internal secretions other than those produced by the gonads themselves. It has been recognized from the earliest times that the nervous system exerts a profound influence upon the sex organs and is in its turn profoundly influenced by them. But it is a matter of comparatively recent observation that there are influences acting from outside upon the sex organs which are not nervous. We term such influences "humoral," indicating thereby that they are conveyed to the sex organs by the blood: in other words, they belong to the class of autacoids to which we have been alluding. Those of which I am about to speak, however, are not to be confused with the autacoids producing secondary sex characters, though some are also manufactured in the gonads. For example, the ovary manufactures hormones which cause ripening and discharge of ova and changes in the uterus which are not responsible for the development of the sex characters. That autacoids related to the reproductive function should be formed in the sex organs themselves is not an altogether unexpected result; but the remarkable observation has lately been made that the pituitary body produces autacoids which are carried by the blood to the ovaries, and excite the internal secretion of those organs so as to cause a ripening and discharge of ova and the accompanying changes in the uterus even in immature animals.

The story of the pituitary body is a real romance—with the distinction that there is nothing of fiction about it. Long known to be present in all vertebrates, its functions, like those of most of the internally secreting organs, were until recently unrecognized. But the clinical observation of cases in which the gland had undergone enlargement and in which there was overgrowth of the skeleton and of the body generally suggested that it might yield an internal secretion which is concerned with growth. This could be tested by experiments on young animals—experiments involving on the one hand administration of pituitary substance, and on the other suppression of the secretion by removal of the gland, or of the larger anterior part which is recognized as the part concerned with growth. If it is yielded to the blood in undue proportion growth may be so much stimulated that a giant is produced. On the other hand, if from any cause this internal secretion of the pituitary body is not passed into the blood or not in sufficient amount, growth will be arrested. Administration of this part of the pituitary has been found to increase the animals' size above normal, whereas destruction of the same part arrests growth and produces dwarfs. Whether there is also a material in the internal secretion of this or some other gland which actively prevents growth is not determined, but is not altogether improbable.

The internal secretion of the pituitary not only influences the general growth of the body, but especially the growth and maturation of the generative organs. A young animal deprived of its pituitary not only ceases to grow but remains infantile; its sex organs do not mature. On the other hand, the administration of anterior pituitary stimulates general growth, and especially the development and maturation of the gonads, causing an immature animal rapidly to mature sexually. In a young female pituitary will cause the production of ripe ova; this it does by acting as a stimulus to the internal secretion of the ovary itself, causing that organ to produce those substances which in adult animals effect maturation of ova and their fixation in the uterus.

Direct evidence that the pituitary substances which thus act on the ovary are poured into the blood can be obtained. They happen to be present in larger amount during pregnancy than at other times. Their effect can then be got simply by injecting a few drops of blood from a pregnant female into a young female mouse. A short time after such injection the mouse's ovaries, which were very small and immature, become enlarged and exhibit unmistakable signs of maturation; the Graafian follicles become large and haemorrhagic like those which, in mature animals, are ready to discharge their ova. Even more remarkable is the fact that these substances do not remain in the blood of the pregnant female, but are got rid of by the kidneys, being passed into the urine, in which they occur in considerable amount. So that, instead of blood, a drop or two of urine injected under the skin of an immature female mouse will easily furnish unmistakable evidence of the existence of pregnancy, even at so early a stage that none of the ordinary signs of that condition is exhibited. This is known as the Zondek-Aschheim test for pregnancy.

Animal Experiment in Medicine.

Everyone can appreciate how important it may be to make an early diagnosis of pregnancy. Yet, by the laws of this country, no medical man is permitted to carry out the Zondek-Aschheim test unless he has a licence to practise vivisection, and even then he may only do so in a place registered under the Act. He must also obtain from the Home Secretary a special certificate permitting him to keep a mouse alive for the few days necessary to enable the result of the experiment to be observed. It happens that the laboratory, which we are now assembled to declare open, is at present the only one in the country which undertakes this duty, though, strictly speaking, the resources of an establishment intended to be devoted to research pure and simple should not be diverted to a routine method of diagnosis which might as well be done anywhere else and by any medical man who has been instructed in the method.

It seems still more extraordinary that hospitals should debar themselves from making such necessary observations. This applies not only to the diagnosis of pregnancy, but even more to that of diseases the rapid and efficient diagnosis of which depends upon experiments involving the inoculation of animals. But even when the hospital possesses a well-equipped laboratory experiments upon living animals, whether for diagnostic purposes or not, are usually barred by the authorities responsible for the administration of the hospital. Samples of blood, of morbid growths, of urine, must be sent away to be tested on animals; no such experiments are allowed under the same roof as the patient whose condition has to be diagnosed. The reason for such a state of affairs is only too apparent; it is due to apprehension that the subscriptions of antivivisectionists will cease to be forthcoming, and that the revenue of the hospital will suffer. On this account hospital authorities will not permit any part of the premises to be registered under the Act, or any operations, or even inoculations for diagnostic purposes, to be made on living animals. A mouse may not even receive a hypodermic injection, although the operation on the mouse may lead to the cure of the man. This is not only wrong in principle; it is not honest, and honesty is always the best policy. A hospital is provided for the treatment of disease, for which rapid and accurate diagnosis is of major importance. Considerations of finance or misapplied sentiment should never be allowed to override this fundamental principle. The time is long past when a surgeon was bold enough to declare that no experiments on animals had ever contributed to his knowledge or influenced his surgical procedures; the declaration merely showed his ignorance of the history of medicine, and of physiology, on which all medicine is based. The science of medicine, the operations of surgery, the action of drugs, the application of preventive and sanitary measures to the health of the community, are all bound up with animal experimentation. Even if the Secretary of State is opposed to experiments on animals, he cannot choose but issue permits for them, for he soon finds on

assuming office how essential such experiments are for the progress of medical knowledge and for the public health. The antivivisection societies have, and can have, no real influence; their propaganda will never prevent a sick person from calling on the services of a doctor whose knowledge is founded on vivisection.

It must be understood that all the work of this and kindred institutions is based upon vivisection. Literally the word means the dissection of living animals, and therefore every surgical operation is a vivisection. But technically and legally it means any experiment on a lower animal of any kind, whether by operation, or by injection, or merely by feeding. This definition of vivisection is not mine; it is that given by the Act of Parliament regulating the practice. No one can make any sort of experiment, whether it is painful or not, upon a vertebrate animal—even upon a fish or tadpole—without a licence from the Home Secretary. That is to say, provided the experiment is made to advance knowledge and not for sport. No farmer may test the effect upon his stock of a novel food without a licence; if he conducts such a test he makes an experiment for the purpose of advancing knowledge, and, if his animals suffer from the change of diet, he renders himself liable to prosecution. Thousands of experiments on animals are recorded every year and reported to Parliament by the inspectors under the Vivisection Act. At least 99 per cent. involve no operation; they consist merely of feeding, or at the most of hypodermic injection. By far the greater number are done in connexion with, and by the direction of, the Public Health Services of the country. All operations which involve incision are performed, like surgical operations, under profound anaesthesia; and if an animal is kept alive after operation it is treated in exactly the same way as a hospital patient, the only difference being that if the animal appears to be suffering pain it is killed painlessly by chloroform. We who experiment upon animals have every regard for the sufferings of animals, but we have a greater regard for the sufferings of humanity. Very appropriate, therefore, are the words which Professor Crew has caused to be carved at the entrance of this institute, which I now formally declare to be opened: "To the advancement of science and to the service of mankind this building is dedicated."

WATER POLLUTION.

ADVISORY COMMITTEE'S REPORT.

THE second report[1] of the Joint Advisory Committee on River Pollution, under the chairmanship of Mr. Herbert Brooks, with Dr. H. Maclean Wilson as medical member, deals with the reception of liquids from industrial and manufacturing processes into the sewers of local sanitary authorities. The growing tendency of factories to settle on river banks conflicts with the necessity of conserving all sources of water supply and with efforts to safeguard the amenities of life. No drastic measures are advocated by the committee. Easily adopted changes are considered advisable at present, and suggestions are outlined for new legislation.

General Legislation Regarding Trade Effluents.

The position of local authority and trader in regard to the disposal of trade effluents is regulated to some degree by the Public Health Act of 1875 and by the Rivers Pollution Prevention Act of 1876. The first required sanitary authorities to provide sewers to drain their districts effectively, and permitted any occupier of premises within the area to allow his drains to empty into those sewers. The second enacted that the sanitary authorities should afford facilities to manufacturers within the district to conduct to sewers the liquids resulting from their trade processes. No authority, however, was compelled to admit fluids potent enough to injure the sewers or to cause any sanitary trouble. Nor was it bound to allow these facilities if its sewers were no more than adequate to the needs of the district. The two Acts were vague enough to create ambiguity as to what the trader might demand and the authority refuse. Legal opinion has made it apparent that the obligations of the sanitary authorities are defined by Section 7 of the Rivers Pollution Prevention Act, with the limitations already stated. But these limitations are so comprehensive that they almost cancel the general obligation, and they are so imprecisely framed that their intentions have sometimes been questioned. Moreover, the powers of the local authority in regard to expenditure and the fixing of conditions are uncertain; and agreements with traders willing to pay for facilities and observe regulations are inhibited by the fact that other traders may claim admission for their effluents without promising to observe the same conditions and without payment. Meanwhile other Acts of Parliament—for example, the Public Health Amendment Act of 1890—help to protect the sewers from liquids that are actually or potentially dangerous to health.

Trade Effluents and Local Legislation.

Local legislation and practice supplement with varying success the indications of general law. In some districts the position has been clarified by special legislation. Many of these local Acts cope with some special difficulty rather than deal with the general principle of right of access to sewers. But corporation Acts of a comprehensive kind prevail in seven districts, including Halifax, Huddersfield, Dewsbury, and Salford. The codes embodied in these statutes are evidently based on the third Report of the Royal Commission on Sewage Disposal, issued in 1903. Where they are in operation, their practical effect is to supersede Section 7 of the Rivers Pollution Prevention Act, and to substitute for it a more detailed machinery to regulate the relations of local authority and trader. They give the trader a definite right to discharge his effluent into the sewers, and impart to the local authority such powers and obligations of disposal as it already possesses in regard to ordinary sewage. They also authorize local authorities to co-operate with each other in the exercise of certain rights and duties. None of these provisions, however, affect the existing water rights of a riparian owner. This system assumes that the local sanitary authority should deal with trade effluents, and it appears to operate smoothly and effectively by working through discussion between the two parties.

Recommendations for New Legislation.

The committee is convinced that the general law concerning trade effluents is at present too indefinite. There is marked necessity for a new code, stating precisely the rights and obligations of the trader and of the local authority, uniform in application, but flexible enough to vary in detail to suit local requirements. The codes of the Huddersfield and Dewsbury pattern suggest the kind of general law required for populous cities. The central recommendation of the committee is that the local authority should everywhere accept the responsibility for the disposal of trade effluents. Its standard of purification will undoubtedly be higher and less expensive than in any system arranged by an individual trader. A single centre, under skilled and constant supervision, will protect the river more thoroughly than the independent control exercised by those whose interests are concerned with their products, and who can hardly afford a skilled supervisor. Besides, some effluents are best disposed of when diluted with domestic sewage. There are effluents, of course, which may be properly debarred from entering the sewer. Rivers bordered by a line of industrial works will need exceptional consideration. But no objection seems cogent enough to affect the recommendation that the local sanitary authority should receive and dispose of trade effluents as simply and as completely as it deals with domestic sewage.

[1] H.M. Stationery Office. 6d.

The committee is of the opinion that the conditions governing the exercise of the right of access to sewers must be fixed by locally drafted regulations; qualifications of the right must vary with regional peculiarities. The flexible code of regulations should be formed by agreement between the local authority and the traders, with reference of unsettled questions to the arbitration of the Minister of Health. Should the traders fail to appoint representatives, the local regulations will be framed by the authority alone. Either party may call for modifications at any time. Among the matters to be determined by the local code are the preliminary treatment and removal of substances, the regulation of flow, financial arrangements, and the inspection and taking of samples.

Minor provisions directly related to the chief recommendation are detailed in the report. Conflicts between different interests in the river can mostly, the committee thinks, be solved by a little good will. The new principle must be applied tactfully, and in some districts without undue haste. But the committee does not approve of the suggestion that an adoptive Act would meet the case. The disquieting inclination of industry to spread itself over districts not industrialized before, and the absence of initiative in securing measures for the adequate protection of many rivers, make it necessary to embody the new system in general legislation. In districts where the problem does not exist, the position would not be changed. In larger districts the authorities would proceed at once by calling conferences of the traders. If the authority remained inert for twelve months a trader could set this machinery in motion by demanding access to the sewers.

Research on Water Pollution.

Some idea of the practical measures that are being undertaken to deal with this problem may be obtained from the second annual report of the Water Pollution Research Board for the year ended June 30th, 1929,[2] issued by the Department of Scientific and Industrial Research. This board was set up in June, 1927, to prepare schemes of research for the prevention of pollution of rivers and other sources of water supply by trade effluents and sewage, and to supervise the investigations authorized by the department. The problems involved are of growing significance to health authorities, particularly in densely populated areas, partly on account of the more widespread adoption of modern methods of sanitation, and partly because increasing supplies of water of good quality are being required for certain industrial processes. Much valuable work has been done by the department not only within the scope of its immediate inquiries, but by encouraging investigation in different parts of the country, and in co-ordinating and applying the information obtained by other Government departments and by the research committees of various organizations. The department co-operates with the Joint Advisory Committee on River Pollution, established by the Minister of Health and the Minister of Agriculture and Fisheries to deal with the legislative and administrative branches of the subject, and with the Scottish Advisory Committee appointed in March, 1928. In addition, monthly summaries of current literature consisting of abstracts of scientific and technical papers have been compiled since October, 1927, to assist those who are concerned with the improvement of water supplies. Arrangements have now been made to publish these summaries, beginning with the number for January, 1930. Some idea of the practical value of the work of the board in co-operating with a particular industry may be obtained from the present report, which contains a description of its experiments in regard to the purification of the waste waters of beet-sugar factories. In its previous report the board recommended that such factories should attempt to re-use water in various operations, and several have already modified their procedure or adopted processes designed for reducing the amount of effluent. The importance of this investigation is indicated by the fact that the daily supply of water used by a factory dealing with 1,000 tons of beet a day amounts to three or four million gallons. Experiments conducted during the year appear to have shown that a high degree of purification can be effected by employing a process of biological filtration. As these experiments continue to furnish accumulations of miscellaneous data, their ultimate results are expected to throw much light on the treatment of other types of waste waters. Part of the work of investigators has been the collection of a large variety of organisms found in the filters. About 800 bacterial cultures have been obtained altogether. Each strain is being tested and classified with the object of isolating pure strains of specific value. Another section of the report describes a comprehensive biological, chemical, and hydrographical survey of the River Tees which has been organized by the department in co-operation with a number of local bodies. The main purpose of this pioneer survey, begun in April, 1929, is to find out the interaction between a typically polluted river and the various effluents that are discharged into it, so that the quantity of polluted liquid that may safely be allowed to enter a river may be accurately determined. Preliminary study of the biological aspects of the activated sludge process of sewage disposal was undertaken during the year at the London School of Hygiene and Tropical Medicine.

London: H.M. Stationery Office. 1930. 9d. net.

BRITISH POST-GRADUATE HOSPITAL AND MEDICAL SCHOOL.

Appointment of Provisional Committee.

THE Minister of Health, Mr. Arthur Greenwood, after consultation with the London County Council and the Senate of the University of London, has appointed a Provisional Organization Committee to proceed with the action necessary to secure the establishment of the British Post-Graduate Hospital and Medical School.

The terms of reference of the committee are to consider and report, in pursuance of the statement made by the Minister of Health in the House of Commons on April 9th,* upon (1) the action requisite to lead up to the planning and construction of the medical school, and (2) the form of government appropriate to the hospital and medical school, with special reference to the position of the London County Council as the local authority responsible for the hospital, and to the position of the University of London in relation to the medical school.

The chairman of the committee is Viscount Chelmsford. The Ministry of Health will be represented by Sir George Newman, chief medical officer, and Mr. M. Heseltine, an assistant secretary; the London County Council by Dr. Florence Barrie Lambert, Sir William Ray, Mr. Angus N. Scott, and Mr. L. Silkin; and the University of London by the Rev. Dr. Scott Lidgett, vice-chancellor-elect, Mr. Sidney L. Loney, chairman of convocation and deputy chairman of the court, Mr. H. L. Eason, superintendent and senior ophthalmic surgeon, Guy's Hospital, and Dr. Edwin Deller, principal of the university.

The other members of the committee (all of them members of the medical profession) are: Mr. Donald J. Armour, senior surgeon, West London Hospital; Lady Barrett, dean of the London (Royal Free Hospital) School of Medicine for Women; Mr. Comyns Berkeley, surgeon, Middlesex Hospital; Sir Robert Bolam, honorary physician to the Skin Department, Royal Victoria Infirmary, Newcastle-on-Tyne, and past Chairman of Council, British Medical Association; Dr. H. B. Brackenbury, Chairman of Council, British Medical Association; Mr. H. W. Carson, senior surgeon, Prince of Wales's General Hospital,

* *British Medical Journal*, April 12th, 1930, p. 709; April 19th, pp. 745, 747, and 762.

Tottenham; Dr. H. G. Dain, chairman of Insurance Acts Committee, British Medical Association; the Rt. Hon. Lord Dawson of Penn, Physician-in-Ordinary to the King, and physician, London Hospital; Dr. H. R. Dean, professor of pathology, Cambridge University; Sir Walter M. Fletcher, secretary of the Medical Research Council; Mr. G. E. Gask, professor of surgery, London University, and surgeon, St. Bartholomew's Hospital; Sir Thomas Horder, Bt., Physician-in-Ordinary to the Prince of Wales, and physician, St. Bartholomew's Hospital; Dr. F. N. Kay Menzies, medical officer of health for the County of London; Lord Moynihan of Leeds, President of the Royal College of Surgeons of England, consulting surgeon, Leeds General Infirmary; Mr. H. J. Paterson, senior surgeon, London Temperance Hospital, and honorary secretary, Fellowship of Medicine and Post-Graduate Association; Dr. Harold Pritchard, senior physician, West London Hospital; and Sir Holburt Waring, senior surgeon, St. Bartholomew's Hospital.

Mr. Heseltine will act as secretary, and all communications on the business of the committee should be addressed to him at the Ministry of Health, Whitehall, S.W.1.

THE BACTERIOPHAGE IN ASIATIC CHOLERA.

AN INDIAN MEMOIR.

AT the invitation of the Government of India, and with the aid of a grant from the Indian Research Fund, an investigation has been undertaken into the pathology and prophylaxis of Asiatic cholera by Professor F. d'Herelle of Yale University; Major R. H. Malone, officiating director of the Pasteur Institute at Kasauli; and Dr. M. N. Lahiri. The result of their work has now been published in the form of a memoir (No. 14) as a supplement to the *Indian Journal of Medical Research*. The lines followed by the investigators included a study of the clinical pathology of this infection, of the environmental factors in its etiology, and of the properties of the vibrio strains isolated; determination of their reaction to bacteriophage cultures and of the effects of administering such cultures to cholera patients; and the careful examination of epidemiological evidence.

It was found that a powerful bacteriophage strain could attach itself to cholera vibrios, eventually destroying them by means of a lytic ferment; a less potent strain caused the vibrios to contract a chronic disease, transmissible to their descendants, and modifying their characters more or less profoundly. The bacteriophage, which is a filterable virus, is said to be a normal inhabitant of the intestine, and to be parasitic on the intestinal flora, having the power to adapt itself more or less rapidly to such invaders as the cholera vibrios. In the course of an attack of cholera in man there occurs, consequently, in the intestine a secondary stage in which both the bacteriophage and vibrios are present; from cultures made at this time colonies of "ultra-pure" strains, and mixed "mutant" strains associated with the bacteriophage, were isolated. This discovery, it is suggested, offers an explanation of the instability of the virulence of the vibrio of cholera, and of its variability as regards the reduction of nitrates, haemolytic power, and agglutinability; the variations detected in these organisms recovered from the intestine were reproduced *in vitro* by treating normal virulent vibrios with the bacteriophage. Attenuation and complete loss of virulence are effected (1) progressively when the vibrio remains outside man, and (2) rapidly on account of the acquisition of resistance to the bacteriophage. The multiplication in the intestine of vibrios with little or no virulence produces no symptoms of cholera; the virulent forms alone can invade and multiply within the intestinal mucosa, where they secrete cell-digesting enzymes, and also haemolysins for the red cells of man. The deduction was drawn that an effective curative measure for cholera would be the administration of the bacteriophage which flourishes best in a slightly alkaline medium; experimental evidence was obtained that this was a sound line of treatment. It is added, however, that, since acute toxic bacillary dysentery (Shiga) is sometimes confused with cholera, it might be as well to use as a general therapeutic measure a mixture of anticholera and antidysentery bacteriophages. Oral administration of the bacteriophage is said to be absolutely innocuous, so that even if the diagnosis is faulty no direct harm is caused by this treatment; it could be employed, therefore, in the more remote villages by ordinary hospital attendants in the absence of medical supervision. Statistical figures are cited in support of these statements; it was found that the mortality rate of patients so treated was 8.1 per cent., comparing with 62.9 per cent. among the controls. When administered within six hours of the appearance of the first symptoms there were no deaths; administered between six and twenty-four hours after the first symptoms the mortality rate was 10.2 per cent.; and after twenty-four hours it rose to 14.3 per cent. The warning is given that the bacteriophage must never be given by subcutaneous injection.

Epidemiological Researches.

Interesting conclusions were reached by the investigators as regards the epidemiology of cholera in relation to the bacteriophage. It is stated that, in a region where cholera has not broken out for several years, no vibrios and no bacteriophage strains possessing virulence for vibrios can be demonstrated. In places where cholera has not occurred for two years at least, non-agglutinating vibrios may still be found, but bacteriophages virulent for the cholera vibrio are absent, or, at any rate, very rare. In areas where cholera is endemic, as well as in other areas where the disease breaks out in epidemic form, carriers of non-agglutinating vibrios are very numerous during the months which follow the disappearance of the epidemic. In these carriers bacteriophage strains also exist, which have a weak virulence for pathogenic vibrios but are capable of rapid exaltation even by a single passage with pathogenic vibrios; from these carriers also can be isolated bacteriophage strains which retain the power to destroy pathogenic vibrios. In a region where an epidemic has raged for some time, as, for example, in the Punjab in 1927, four months after its onset three groups of human beings may be distinguished—namely: (1) those persons in whose environment no bacteriophages virulent for the vibrio are found, this group being highly susceptible to infection; (2) those residing in places where non-agglutinating vibrios and bacteriophages virulent for pathogenic vibrios are present in wells or flies, these persons being "healthy carriers" and resistant to the epidemic; and (3) those living in districts where cholera has occurred in the course of an actual epidemic, including convalescent carriers and resistant persons.

When an epidemic first breaks out no bacteriophage strains are found in the water of wells, but they subsequently appear, at first in the flies found in houses where convalescents live, and then in the well waters; the epidemic ends when the bacteriophage becomes generally diffused. These bacteriophage strains are highly virulent to vibrios from the very outset, and are directly derived from convalescent patients. A few days after the end of the epidemic they rapidly disappear, being replaced by less virulent bacteriophage strains, which can, however, become exalted by a single passage at the expense of cholera vibrios. A curious corollary is that the cholera patient spreads the pathogenic vibrios, and is therefore infectious, while a carrier spreads adapted bacteriophages, and, by this means, propagates the means of resistance, protecting crowds of previously uninfected individuals.

Prophylaxis.

Methods of isolation, sterilization of water, and preventive vaccination are only partly effective in the prevention of cholera, especially when the drinking water is obtained from wells. The conclusion is therefore reached that the deliberate propagation of the bacteriophage offers the only effective means of preventing cholera in epidemic form. Instead of waiting for the bacteriophage to be carried to the wells by natural means it would be preferable to introduce cultures of potent strains directly into the water supply of any group of persons in whom cholera has broken out. Experimental work is reported

by the investigators to show that such a measure is in practice highly efficacious. Indications are given of the lines on which the conclusions reached in this report might be experimentally tested on a large scale.

Finally, the widespread application of this remedy, though difficult, is not impossible, and the concluding paragraph of the report deserves quoting in full in view of its suggestion to make use of human suggestibility in promoting health.

"It must be noted, however, that the inhabitants of India, generally speaking, object to the addition of any material whatsoever to their drinking water, and it is admitted that if a measure is to be applied with any hope of success the public must accept it voluntarily. There may perhaps be a means of making prophylaxis by the bacteriophage attractive. Hindus consider the Ganges water to be sacred: a laboratory for the preparation of cultures of bacteriophages might therefore be established on the banks of this river and the culture media prepared from its water, indicating this fact in vernacular on the ampoules containing the bacteriophage cultures. It is probable that Hindus would be pleased to see the water of the sacred river poured into their wells; some of them would perhaps attribute the beneficial action to this; what does it matter if the object be achieved and the sum total of human suffering a little diminished?"

EPSOM COLLEGE.

Annual General Meeting.

THE seventy-seventh annual general meeting of the Governors of Epsom College was held at the office, 49, Bedford Square, W.C., on June 27th, under the presidency of the chairman of council, Dr. RAYMOND CRAWFURD.

The scrutineers, Sir William Hale-White, Mr. W. Cyril Tomlinson, and Dr. Septimus Sunderland, reported that the successful candidates for pensionerships and foundation scholarships were as follows.

	Votes.
Pensioners:	
*Nicholson, Mrs. Agnes A.	6,987
†Cadman, Dr. Ernest S. R.	6,137
†Greenwood, Mrs. Marie M.	4,471
†Humphreys, Dr. Edward A.	4,334
Foundation Scholars:	
Taylor, David H.	15,941
Daw, Ian Almeric	11,509
White, John H. B.	10,389
Butler, Gerald A.	9,409

* Brodie Sewell Pensioner. † Ordinary Pensioners.

The secretary reported that Dr. Edward W. Forster, who was at the head of the list of unsuccessful candidates, would be appointed an ordinary pensioner, under By-law 16, at the council meeting, which would be held immediately after the annual general meeting, a vacancy having arisen.

The annual report referred to the loss sustained by the College through the death of the Earl of Rosebery, its president for twenty-nine years, and the election of Viscount Burnham to succeed him in that office. While there was a moderate surplus on the income and expenditure account for the year, the council urged friends of the College to renew their efforts to obtain fresh annual subscribers to make up for the loss of many generous supporters every year. Special reference was made to the support given by the British Medical Association and its Charities Committee, the Medical Insurance Agency, and numerous Panel Committees. The council also expressed thanks to the Editors of the *British Medical Journal* and the *Lancet* for assistance by means of appeals and for publishing official notices. The following reference is made to the Scholarship Fund, administered as a memorial to the late Editor of the *British Medical Journal*.

"The Medical Insurance Agency has generously handed over a further sum of £650 for the Dawson Williams Presentation Scholarship Fund, of which a sum of £500 is to be devoted to the capital required to establish in perpetuity a scholarship of £150 a year in memory of the late Sir Dawson Williams, C.B.E., M.D., for the necessitous son of a medical man or woman. The benefits already awarded from this fund by a joint Committee of the Medical Insurance Agency and Epsom College have been greatly appreciated, and it may be added that the intention underlying the foundation of this scholarship was to help a friendless boy, especially one unlikely to be able to secure election to an Epsom College Foundation Scholarship."

The progress of the new sanatorium fund has not been so rapid as the council hoped for, contributions received during the year amounting to little more than £2,200; the sum in hand on December 31st last was £7,765. The present sanatorium, being unsuited to its purpose, cannot be worked economically, and a sum of not less than £25,000 will be required for the new buildings, the fittings, and the furniture.

The report was adopted on the proposal of the chairman, and Lord Dawson of Penn, G.C.V.O., Sir Milsom Rees, K.C.V.O., and Mr. T. Hollis Walker, K.C., were elected vice-presidents of the College in recognition of valuable services rendered. A cordial vote of thanks to Dr. Raymond Crawfurd concluded the business.

Scotland.

Extension of Dundee Royal Infirmary.

THE formal opening took place, on June 20th, of a new maternity hospital, erected at a cost of £38,000 as an extension to Dundee Royal Infirmary. The hospital was built and equipped by the late Mr. Robert Bower Sharp and his brother, Mr. Frederick Bower Sharp of Hill of Tarvit, and has been endowed by the latter and his sister, Miss Sharp of Fernhall. Mrs. F. B. Sharp performed the opening ceremony. Mr. J. C. Buist, LL.D., president of the Infirmary, who occupied the chair, recalled the fact that about thirty years had elapsed since the benefactor of the hospital, Sir James Caird, had given them the maternity hospital. A much larger and more modern building was now being inaugurated. Dr. James Haig Ferguson, president of the Royal College of Surgeons of Edinburgh, remarked that it had been well said that a hospital was a treasury to which the rich could go with their pity and the stricken with their needs. Dundee was now in possession of a well-equipped and thoroughly up-to-date maternity hospital, capable of dealing adequately with the needs of its district. This hospital would be an incalculable boon to the city, for both women and infants; it would also provide training of the highest standard for doctors, nurses, and midwives. He could confidently say that he had never seen a better arranged maternity hospital, nor one more wisely planned. The advantage of the close association of a maternity hospital with a gynaecological department could not be too strongly emphasized; at Edinburgh it was hoped that there would be a similar close co-operation in the near future. Dr. Ferguson considered that, in view of the fall in the birth rate, it was more than ever necessary, from an economic standpoint, to do everything possible to conserve the child life of the country, and hospitals such as this were a most important factor in achieving this end. The voluntary hospital was an honour to their country and to their civilization. In voluntary hospitals in Scotland last year 110,000 in-patients and 360,000 out-patients received treatment. Dr. John Parlane Kinloch, Chief Medical Officer of the Department of Health for Scotland, congratulated Dundee on this valuable addition to its Infirmary. Forty years ago, he said, such health services as they had in Scotland to-day would have been regarded as a Utopian dream. He thought that the voluntary hospitals must remain the real medical pivot of the health services, and there should be no rivalry, but co-operation. Obstetricians and specialists had to discover why women died, and they needed institutions like the present one to put the new knowledge into effect. The hospital would be a model for Scotland for many years.

The new hospital is a ferro-concrete building of three stories, and has departments for the care of in-patients and ante-natal patients, a district room and inquiry office, a students' room, and a lecture theatre suite. Two wards, each with twelve beds, have been designed to admit the maximum amount of sunlight. A cot hangs at the foot of each bed, and a wireless installation will enable patients to listen-in. There are also smaller wards fitted with french windows and containing two beds. Separate accommodation is provided for the delivery and after-care of potentially septic patients, and rooms are set apart for babies, for those prematurely born, for women in the first stage of labour, and for patients suffering from eclampsia. Adjoining the delivery room is the operation theatre, with surgeon's room, instrument, sterilizing, and washing-up rooms, and students' gallery. The only projections on the walls of the operating theatre are a sink and a radiator. All other fittings,

such as electric light switches, x-ray view box, and blackboard, have been built flush with the walls. Special features include a linen chute, x-ray and electro-cardiograph plugs, and emergency lighting equipment at all strategic points. The latest type of scialytic light gives very satisfactory illumination during perineal operations. Doors and woodwork are of teak, furnishings of oak, and the floors are laid in terrazzo and oak blocks. A short bridged passage at the level of the first floor runs directly from the gynaecological ward in the main building to the operating theatre in the maternity hospital.

St. Andrews Ambulance Association.

The annual meeting of the St. Andrews Ambulance Association was held in Glasgow on June 26th. Lord Provost Kelly, who presided, stated that during the past year the total number of patients conveyed by the association's wagons was 35,439. Of these, over 18,000 were carried in Glasgow, including 9,308 cases of accident. Among the latter 1,781 were caused by motor vehicles, an increase of 306 compared with the figure of the previous year. During the year 10,021 pupils qualified in first-aid classes. The association had now more than fifty branches throughout Scotland. At the conclusion of the meeting Colonel Donald James Mackintosh, C.B., M.V.O., M.B., LL.D., who had completed nineteen years as chairman of the council of the association, was presented with his portrait. The Lord Provost recalled the fact that Colonel Mackintosh had become medical superintendent of the Victoria Infirmary, Glasgow, in 1890, and two years later had been appointed medical superintendent of the Western Infirmary, where he had devoted much time to questions of hospital construction, equipment, and management. His book on these subjects was well known, and his advice was very widely sought when hospital construction or extension was under consideration, not only in Scotland and England but in the Dominions. From 1911, when Colonel Mackintosh had accepted the chairmanship of the council of the association, the four motor wagons then possessed by the association in Scotland had increased to seventy-seven, and the number of patients conveyed had been quadrupled. Colonel Mackintosh had organized the raising of £33,000 for the purpose of housing and equipping the association, and this had been successfully accomplished. The portrait is the work of Mr. James B. Anderson, a Glasgow artist. In the evening an At Home for members of the association was held in the new premises, and a presentation of silver plate was made to Mrs. Mackintosh.

Physical Education in Scotland.

A conference between representatives of the Educational Institute of Scotland, the Edinburgh Head Teachers' Association, and the Scottish Education Department was held, on June 23rd, to consider the new regulations concerning physical education which had recently been adopted by the Edinburgh Education Authority. These involved the inclusion of more physical education in school curricula, the term "physical education" covering various physical subjects, from games and swimming to lectures on the body and on methods of keeping fit. The difficulty was to find time for extra physical education without encroaching upon ordinary subjects. It was stated that it was essential that the time to be devoted to any individual subject should be considered in relation to the curriculum as a whole. The time for physical exercises had been more than doubled within the last three years without corresponding reduction in the requirements of other subjects. The result was an unhealthy pressure on pupils and teachers. Difficulties arose because the performance of exercises arranged for the playground depended on the weather, while exercises taken in the classroom were necessarily limited in scope, and the atmosphere was not always satisfactory. Some schools possessed a hall, but even in such cases it was difficult to fit in all the periods of physical exercise in the time available, and to arrange that they should be followed by the necessary periods of comparative rest. Moreover, the noise caused by the moving and drilling of classes was apt to disturb work in the rest of the school. It was decided that discussion of this subject should be resumed at a later date.

University of Edinburgh.

At a meeting of the University Court of the University of Edinburgh, on June 24th, at which Principal Sir Thomas Holland presided, it was intimated that a joint selection committee of the Edinburgh Hospital for Crippled Children and the University Court had appointed William Alexander Cochrane, M.B., F.R.C.S.Ed., to the conjoint post of surgeon to the Hospital for Crippled Children and university lecturer in orthopaedics. At the same meeting it was resolved to institute a diploma in tropical veterinary medicine. The course for this diploma will be given partly at the university and partly at the Royal (Dick) Veterinary College, and will occupy six months, from October to March. The first course will start in October, 1930. The course will include classes in parasitology and entomology, bacteriology, meat and milk production, feeding of animals, breeding of animals, epizoology, and a number of lectures and demonstrations in subjects of special interest to tropical veterinary surgeons. This is the first institution of such a diploma in Britain; it has been recognized that a course of this nature should be an integral part of the training of every colonial veterinary officer. It will greatly increase efficiency and probably add to the material prosperity of the colonies, besides saving much time in individual study.

Edinburgh Sick Children's Hospital.

At the annual general meeting of the Royal Edinburgh Hospital for Sick Children the Earl of Home submitted a resolution emphasizing the claim of the hospital on the liberality of the public. The report showed that 2,846 patients had been treated in the hospital during 1929, compared with 2,762 in the previous year. The average daily number of patients in hospital was 114, and the average duration of stay was 17.2 days. The total number of attendances at the out-patient department amounted to over 41,600. During the year the Meiklehan Ward for ear, throat, and nose cases had been opened, and this had had the effect of reducing the waiting list considerably. Children were not now kept waiting for more than a month for admission; the waiting list was now about thirty-five. The ordinary income of the hospital was £13,813, compared with £12,214 in the previous year, and the ordinary expenditure was £18,903. An extraordinary income derived from legacies, exclusive of those given to name cots, amounted to £23,165. Reference was made to the fact that in the course of the past year the late Dr. John W. L. Spence tendered his resignation after acting as radiologist to the hospital for twenty-two years, and that it was impossible to speak too highly of Dr. Spence's services to the institution.

Caledonian Medical Society.

The forty-fifth annual meeting of the Caledonian Medical Society was held at Inverness on June 20th and 21st, under the presidency of Dr. T. C. Mackenzie. At the annual dinner Dr. J. Parlane Kinloch, Chief Medical Officer of the Department of Health for Scotland, referred to the great development of the medical services that was taking place. Public health, he said, should be outside the realm of politics. He considered that an extension of the Insurance Act to include wives and dependants of insured persons had become imperative. With their experience of existing health agencies and with a determination to fill up the gaps in their existing knowledge, he thought that there was a fair prospect of health in Scotland.

Memorial to Scottish Doctor.

A portrait of the late Dr. James Cameron, Loanhead, was unveiled on June 25th in the Town Hall, Loanhead, in the presence of a large gathering of the patients of the deceased. Dr. Cameron, who was a prominent member of the Edinburgh Branch of the British Medical Association, had practised in Loanhead for over thirty years. The portrait, which is the work of Mr. Stuart Carmichael, Dundee, was accepted by Provost Lawrie of Loanhead on behalf of the citizens. It will be hung in the Town Hall as a permanent memorial to Dr. Cameron's medical activities.

England and Wales.

The MacAlister Lecture.

THE fifth annual lecture in memory of the late Sir J. Y. W. MacAlister, secretary and librarian of the Royal Society of Medicine, was delivered under the auspices of the London Clinical Society at the Temperance Hospital, Hampstead Road, on June 24th. Sir Robert Armstrong-Jones was the lecturer, and took for his subject "The evolution of the human mind," which led him into some interesting psychological definitions. The senses, which were the motive power of the mind, he said, were usually considered to be five, but in reality the number was much greater; there were probably about sixty local outposts or receptors, ready at any moment to carry impressions inwards, but there was only one effector to carry the result of sensation outwards—namely, the voluntary muscle. A pure sensation was a very fleeting thing, quickly merging into association with others. The mental effect was called the percept; it was the reaction of the mind to something experienced by one of the senses. When a percept was recalled to the mind afterwards, then it became an image, or concept, or idea. These ideas could be combined with others by what was termed constructive association. All great works in poetry or prose, the higher mathematics, the making of diagnosis, belonged to such association. It was the work of the attention to group the concepts or ideas so that they coalesced or formed larger groups of constructive knowledge. All ideas existed, even in the mind of the cleverest, in a thorough jumble, and in this chaotic state they lay until selected and arranged by the attention, the interest, and the memory. The lecturer pictured a constant struggle among ideas to attain the threshold of consciousness. Many were doomed never to reach that level, and those which did succeed in reaching it remained there but a moment—at most thirty seconds—before being displaced by other ideas. Two laws dictated the arrangement of ideas—namely, the laws of similarity and of contiguity.

Sir Robert Armstrong-Jones went on to describe consciousness as consisting of feelings, sensations, ideas, and wishes. It was an experience familiar to everyone that things which were formerly in the consciousness could be recalled by an effort of will. But if there was, as seemed certain, a subconscious mind, there appeared to be a yet further territory beyond the subconscious. In the unconscious part were infantile experiences, inherited tendencies, and forgotten memories. No effort of will could restore those memories as those in the subconscious might be restored. The lecturer also discoursed on the freedom of the will, one of the oldest and most debated questions in psychology. Few realized how closely the will was related to the muscles. In reality voluntary movement might be regarded as the outward expression of an idea. In giving effect to mental decisions the will inhibited those movements which opposed the decision while it emphasized those which favoured it. The suspension of the will left the mind to its automatic activity, as seen in acute insanity, in which coherent thought was impossible, speech inconsequeat, and conduct disordered. The lecture was illustrated by lantern slides and portraits of great students of the mind, and by drawings illustrating the development of the animal brain and nervous system.

Sir Donald MacAlister, who was asked by the chairman, Mr. H. J. Paterson, to add a few words, expressed his gratification at the honour which was done to his brother's memory. He was well aware—for he had been associated with his brother throughout his life—how ambitious he had been for the upbuilding of a great medical society in London, and how he surmounted difficulty after difficulty in his determination to bring it about. It would be long before the medical profession forgot the services which John MacAlister, not a medical man, rendered in bringing into existence a league of societies—the Royal Society of Medicine—for the benefit, not only of the profession, but of the whole community.

Psychological Treatment of "Difficult" Children.

A meeting in support of the clinic for nervous, delicate, and difficult children, which has been open for some time (at No. 85, Clarendon Road, London, W.11), was held in the Women's Service Hall, Westminster, on June 25th. Professor Winifred Cullis occupied the chair, and spoke of the work of the clinic as representing the beginning of a movement almost as important as that which followed from the first infant welfare centre. An address was given by Dr. Marguerite Lowenfeld, honorary medical director of the clinic, who said that it represented an entirely new approach to the psychopathology of childhood. Children from all kinds of environments were being referred to the clinic by the London County Council, by welfare societies, by private practitioners, and others, and the children were treated on a group basis by physicians, assisted by women who had been trained in psychology, and in co-operation with the parents. All the work of the clinic, she said, centred in the play-room. The children were observed psychologically while at play, difficulties were brought to light, and by play they were helped to overcome their faulty reaction to life. Of 110 children referred to the clinic during the past eighteen months, already one-third had been discharged cured, while others showed various degrees of improvement. Dr. Lowenfeld gave many examples of mischievous or rebellious children, or children under emotional stress, who had been brought to the clinic, patiently studied, and in whom sometimes only a slight adjustment availed to restore to the normal. Children who reacted to life in unsuitable ways, she said, did so for one of two main reasons. The first was connected with their physical constitution. In this country we had got beyond the days of severe epidemics, and now had time to give some thought to more standard factors. The first business of the clinic was to discover whether there was anything on physical lines which might be done to rectify abnormal feeling or behaviour. The second reason was due very often to adult repression, based on a misunderstanding of the child's world. The adult proceeded very largely on the lines along which he had been trained, and he was governed in his conduct by the necessities of the circumstances and by his reason. The child, however, lived the "picture" life; the child's wishes were its main realities, and seemed to it absolute. The clinic made an attempt to get on to the child's level. When it was considered how many of those who became great figures in this country's history began as "difficult" children this seemed to her one of the most hopeful movements of the day. Certainly £30,000 a year was better spent in an effort to study such children and put them right than £300,000—the sum spent in the last recorded year—on the maintenance in prison of lads and girls between the ages of 16 and 21. Miss Coster, principal of Wychwood School, Oxford, also addressed the meeting on behalf of the clinic. It was stated that the recognition of the value of the clinic's work had resulted in applications far beyond the scope of the present quarters or the capacity of supervision of the present staff, so that a waiting list had had to be established.

Reception to American Public Health Officers.

The London School of Hygiene and Tropical Medicine gave a reception, on June 27th, to a party of members of the American Public Health Association who have been passing through Europe to attend various hygiene congresses. The guests included a number of State and district medical officers, sanitary engineers, superintendents of sanatoriums, health directors of industrial undertakings, heads of public health laboratories, health educationists, school medical officers, and nurses in various capacities in the public service; and there were invited to meet them certain officers of the Ministry of Health and medical officers of health for the metropolitan and adjacent areas. The guests were received in the library by the vice-chairman of the board of management, Sir Cooper Perry, and other members of the board. Unfortunately, Sir Andrew Balfour, director of the school, was prevented by illness from being present, but the staff were in attendance and conducted the visitors through the interesting museum and laboratories and other departments of the Gower

Street building. In the statistical laboratory Professor Major Greenwood showed and explained to guests the chart which is prepared there from the notifications of infectious diseases, and indicated how it could be used to some extent in forecasting the trend of infections; he also gave an account of the way in which the elements of statistics are taught to public health students. Some demonstrations, including one of a dust-preventing device for use with rock drills in mines, were given in the department of applied physiology, and in other departments. The transatlantic visitors expressed admiration for the design and spaciousness of the London School.

Gas Leakage in Buildings.

The London County Council, at its meeting on July 1st, considered the recent report of the departmental committee (presided over by Sir Evelyn Cecil) on deaths from gas poisoning. It was stated on behalf of the Council that leakages of coal gas from street mains into tramway cable manholes and feeder pillars are not infrequent, but that every care is exercised to prevent employees from entering manholes before tests for gas have been carried out and thorough ventilation provided when necessary. The precautions have proved adequate, and no employee working in a tramway manhole has been injured by coal gas or gas explosion. With regard to the recommendation of the departmental committee that by-laws should be framed to provide that geysers are properly fixed and adjusted, and that both the apparatus and the room in which the apparatus is fixed should be adequately and efficiently ventilated, it was pointed out in the Council that there is nothing in the London Building Act which enables the L.C.C. to require the work specified in this recommendation to be carried out. Requirements in the Act for the ventilation of domestic buildings and habitable rooms in basements are limited to the height of the rooms, size and position of windows, and the provision of open space about buildings. There is no requirement that flues shall be provided, although the Act contains somewhat stringent regulations with regard to their construction when they are provided.

India.

Medical Education in India.

A CONFERENCE called by the Government of India was held at Simla on June 23rd and 24th to consider the maintenance of adequate standards in provincial institutions for medical education. It was attended by representatives of the provincial Governments, surgeons-general, and representatives of Indian universities with medical faculties. A resolution was adopted expressing regret at the decision of the General Medical Council to withdraw conditional recognition of the medical degrees granted by the Universities of Bombay, Calcutta, Lucknow, and the Punjab.[1] A further resolution was passed by the conference urging the Secretary of State for India to modify the rules governing recruitment to the I.M.S., so as to admit to the service medical practitioners possessing qualifications registrable in India but not recognized by the General Medical Council. A message from the Simla correspondent of the *Times*, published in that newspaper on June 26th, states that "there was unanimous agreement on the desirability of establishing an All-India Medical Council to ensure proper standards and qualifications, and upon details of the method of procedure to this end. The Government of India will forthwith prepare a bill on those lines and refer it to the local Governments for their observations before submitting it to the Central Legislature for enactment. This process should be complete by the opening of the next Delhi Session."

King Edward VII Memorial Hospital, Bombay.

In spite of an increase of nearly a thousand hospital beds in the city of Bombay during the last five years the demand for hospital accommodation is growing, and over 8,000 patients were treated in the King Edward VII Memorial Hospital in 1928–29. The daily average number of beds was 344. Several methods of relieving the congestion are suggested by Dr. Jivraj Mehta, dean of the hospital, in his report for that year. It appears that part of the congestion is caused by the fact that many patients, paralysed or incurable, remain for long periods in the institution as they have no relatives to claim them. Dr. Mehta suggests that the care of such patients might be undertaken by the Beggars' Camp in return for grants from the corporation. Extra accommodation would also be secured if a home for convalescent patients were available outside the city. A proposal that an infirmary should be built in Bombay, with 250 to 400 beds for chronic and nerve cases, was submitted to the Government without success. No provision existed at the date of the report for the proper treatment of mental patients, and a casualty department had still to be organized. In February, 1929, 144 casualties were treated in ten days as a result of civil disturbances; the resident medical and nursing staffs and students are reported to have given excellent service during these emergencies. The need for more extensive accommodation was also a problem in the out-patients' department, where 48,000 cases were dealt with during the year, an increase of over 8,000. Although the skin, venereal, and aural sections of the department had twice the accommodation of the previous year they were apparently overcrowded and cramped from lack of space. Two new skin and venereal disease wards were expected to be ready for the admission of patients in 1930. In consequence of the report of the delegation of the British Social Hygiene Council, referring to the alleged high incidence of venereal diseases in Bombay, proposals were made for a systematic study of the incidence of these diseases among all patients attending the hospital. The advisory medical board, which held sixteen meetings during the year, discussed, among other questions, the establishment of a central clinic for school children at the hospital and the provision of a library for patients. Consideration was also given to the bill to establish a medical council in India, and to provide for the maintenance of a British Indian medical register. Dr. Mehta also gives a brief account of the year's work at the Seth Gordhandas Sunderdas Medical College, which at the end of 1928 had 192 regular students on its roll, including ten women. The college is now affiliated for certain subjects to the University of Bombay. Three investigations by members of the professorial staff have been approved by the governing body of the Indian Research Fund Association; one of these is an investigation into the neo-natal mortality in Bombay. A studio has been erected to facilitate the taking of photographs of patients, and the purchase of additional equipment included a cinema apparatus. Substantial additions to the anatomy and pathology museums are also recorded.

An Improved Antirabic Policy.

A memoir has been issued by the Indian Research Fund Association containing the results of a first series of comparative tests in regard to the immunizing value of etherized and carbolized vaccines. Continuous investigation at the Pasteur Institute, Kasauli, from 1925 to 1928 seems to have confirmed the impression that Alivisatos's etherized vaccine is much more effective in dealing with severe cases of hydrophobia than Semple's carbolized vaccine, which is at present the standard treatment in India. Further experiment is apparently necessary before the reasons can be definitely ascertained. Modified forms of both methods are specified in the memoir for the treatment of different classes of cases. According to the authors of the memoir—Lieut.-Colonel J. Cunningham, I.M.S., and Major R. H. Malone, I.M.S.—sufficient evidence of a scientific nature has now been accumulated to warrant the adoption of an improved antirabic service in India. Any successful scheme, in their opinion, must provide for more extensive facilities to secure adequate treatment with the least possible delay for every person exposed to risk. Ample proof has evidently been obtained at Kasauli that the number of persons who attend for treatment is only a fraction of the population exposed to risk. The authors advise that a policy of decentralization should be introduced by which milder cases would be treated at

[1] See *British Medical Journal*, March 15th, 1930, pp. 508–511.

subsidiary centres situated in a convenient area, intensive treatment of severe cases being confined to the central institute. They also suggest that officers in charge of these centres should be specially trained, particularly in the assessment of the degree of risk of wounding, and in the observation and care of patients undergoing treatment. In addition, instruction should be given in distinguishing the appropriate classes of cases and in the preparation of antirabic returns, thereby enabling the central institute to issue and analyse the "health inquiries" for the whole area under its supervision.

Correspondence.

RESEARCH IN MEDICINE.

SIR,—I have read with much interest and appreciation the article by Sir Thomas Lewis in the *Journal* for March 15th, entitled "Observations on research in medicine: its position and its needs." This article is of extraordinary importance, for upon the direction which medicine now takes depends its future for generations, and I trust that the publication of these "observations" by one preeminently qualified to make them will have a profound effect. The article refers, however, almost exclusively to conditions in Great Britain, and the remedies suggested are those to be applied to the British system of medical education and the concomitant hospital training. It may therefore be of interest to your readers to know that a well-defined movement to accomplish the purposes so admirably stated by Sir Thomas Lewis has existed in the United States for the past twenty years, and that through the impetus of this movement many of his desiderata are already in full flower on this side of the Atlantic.

It should be made clear at the outset that, although many features of this movement are peculiar to America, its origins are directly traceable to the central European universities, where, since the middle of the nineteenth century, research has had a prominent part in every department representing clinical medicine. The history of this period is too well known to require repetition here, but it should be understood that this letter does not attempt to claim any priority for America. The actual beginnings of the movement in America itself may properly be assigned to the organization of the American Society for Clinical Investigation in 1909 and to the opening of the Hospital of the Rockefeller Institute for Medical Research in New York in 1910. Under the able and wise leadership of Dr. Rufus Cole this hospital not only provides such opportunities as Sir Thomas Lewis describes, but has also had an influence on research in medicine the full extent of which can scarcely be appreciated. In the hospital of the Rockefeller Institute provision is made, under ideal conditions, for physicians whose entire energies are devoted to work with neither the distractions nor the competition incident to the practice of medicine. It is a hospital dedicated wholly to investigation, and seems to fulfil all of the conditions adumbrated by Sir Thomas.

The creation of such a hospital in America twenty years ago was a distinct step in advance, and was probably the only step which could have been taken at that time to such great advantage, since the universities were not then ready for the development which has since occurred, and which was made possible largely through the example of this hospital. From my reading of Sir Thomas's "observations" it would appear to me that the creation of such a hospital in Great Britain at the present time would fill a need similar to that which existed in America twenty years ago. The trend of thought in America has, however, been away from the independent research hospital, and from the "research unit" in a general hospital, to research in medicine under strictly university auspices, and upon such a basis as has for generations existed in other fields of human knowledge. It is significant that Dr. Cole, while director of the Hospital of the Rockefeller Institute for Medical Research, was the first to show the way, and his paper, published in *Science* (April 2nd, 1920, pp. 229–340), entitled "The university department of medicine," is a most stimulating ideal of university medicine. During the period of twenty years under discussion the universities in America have made great progress in the directions indicated by Sir Thomas, so that at present nearly every university department of medicine worthy of the name makes more or less ample provision for careers of research. Standardization of such opportunities has not occurred, and is probably not desirable, but it may be said in general that there are more research positions than there are properly qualified men to fill them. Moreover, another of Sir Thomas's desiderata has been fulfilled. The American Society for Clinical Investigation, organized in 1909, the members of which are chosen from the ranks of active workers in "clinical science," owns and controls the *Journal of Clinical Investigation*, which restricts itself, in Sir Thomas's words, "exclusively to original matter of proper quality." This society may be said to represent the independence of the movement from the practice and teaching of medicine.

Due to a most fortunate combination of circumstances the University of Chicago has been able to take the final steps necessary to unite medicine with other university disciplines, and to provide the environment, organization, and facilities now believed to be most favourable to "progressive medicine." For some thirty years the University of Chicago has supported strong departments of anatomy, physiology, physiological chemistry and pharmacology, hygiene and bacteriology, and pathology, without having had—a matter of equal importance—any departments representing clinical medicine in its various phases. Partly due to the absence of the latter, but also due to the wisdom and foresight of those concerned with the establishment of the other departments, these were conceived of not as departments of a school of medicine, but as scientific departments of a university, devoted to the same aims as were the departments of physics, chemistry, and biology. Their situation has thus been analogous to that of similar departments at Cambridge, and the success of the departments in the two institutions can be traced to the same condition—separation from the clinical school of medicine of the past generation.

When the University of Chicago prepared, some seven years ago, to move forward in making provision for departments of clinical medicine, the ground had accordingly already been laid, both nationally and locally, for the next logical step. Consequently, instead of organizing a "medical school" in the usual sense, the University was free to add new departments of medicine and surgery, and more recently of obstetrics and gynaecology and of paediatrics, assigning to them places within the University on the same basis previously occupied so successfully by the departments already long in existence. For the first time in American medicine, it is believed, a department of medicine has been admitted to full rank in a university, and admitted because it is expected to behave as should a university department—that is to say, to devote itself to what Sir Thomas calls *progressive medicine*.

The University has provided these new departments with facilities befitting the science which they represent. Each department has its own clinic, with the admission and discharge of patients wholly under its own control, its own extensive laboratories forming a part of the clinic and suited for any form of investigation suggested by the problems of modern medicine. These departments recognize, it is true, some responsibility for medical education, but it is medical education far removed from the conventional type, consciously emphasizing *progressive* rather than *curative* medicine. Here again the burden assumed by the department is wholly within its own control, since the University, being a privately endowed institution, is under no obligation to provide physicians for practice in the community.

The first departments, medicine and surgery, were opened, together with their respective clinics, in October, 1927, and have been in operation almost three years On the occasion of the opening of the medical clinic addresses were made by Dr. Rufus Cole and Dr. Alfred E. Cohn, both members of the Rockefeller Institute for Medical Research and in charge of divisions in the hospital. Dr. Cohn's address ("Medicine and science," *Journal of Philosophy*,

1928, xxv, pp. 403–416), which received editorial comment in the columns of the *British Medical Journal* (1929, ii, 676), is of particular interest in the present discussion. He emphasized the necessity of regarding medicine, equivalent in England to the use of the term pathology, as an independent science, this status being preliminary to its being elevated to the position of a university discipline. He explored the situation of medicine in respect to related sciences, and suggested arguments which seemed to justify the view that medicine can and should be regarded as belonging to the category of independent sciences. He described what the advantages were for the study of disease, were it investigated actually by physicians, especially by those acquainted at first hand with the phenomena of disease, and trained to their observation, since it was obvious that neither chemists, physiologists, bacteriologists, nor anatomists could be supposed to regard such phenomena as primarily or exclusively their concern. He attempted to show that in a rational sense an analysis of the processes exhibited by various groups of diseases necessarily preceded an attempt to rectify these processes in the enterprise called therapeutics. Conceptually, therefore, there was, he thought, an advantage in distinguishing between the study of disease and of therapeutics. There existed, of course, that aspect of therapeutics, which is usually designated as "roughly empirical," which had its proper and deserved place in the armamentarium of physicians, but which obviously was different in origin and design from "rational therapeutics," a good example of which was chemotherapy. On account of these various considerations he believed, as a logical inference, that a difference distinguished practical (or the practice of) medicine from the study of disease. It was the pursuit of the latter which was the occasion for constituting a university department of medicine.

These theoretical points of view concerning the meaning of medicine have served as the "programme" of the university clinics of the University of Chicago. They appear to resemble those which Sir Thomas Lewis now premises in his new proposals. His plan, similar to that followed at Chicago, will, if actualized, bring into existence in England a reform which recognizes what in any case is a fact—namely, that the study of disease and the practice of medicine differ. Systems or types of education designed to introduce men to a knowledge of these distinct, even if related, matters must also differ. So instructed, men will, depending on their purposes and desires, be in a position to choose their callings with due regard to the various opportunities which medicine offers.—I am, etc.,

FRANKLIN C. MCLEAN,
Director of University Clinics,
The University of Chicago.

June 11th.

ANTIMALARIA MEASURES.

SIR,—In your issue of April 12th, which has just reached me, Colonel Gill's letter contains many incorrect statements—so many that I fear the limits of space in your *Journal* force me to comment only on the two which more particularly misrepresent my own position. He states that Ross, and those who, like myself, think with him, are "completely satisfied with the state of scientific knowledge attained some thirty years ago." Colonel Gill has quite evidently failed to realize that an epoch-making discovery like Ross's is great not only in the knowledge which it gives, but in its opening so many other lines of research. To my personal knowledge Ross has always encouraged this, and, were it necessary, I think I could prove from many sources that I, too, have also encouraged progress.

Had Colonel Gill read with more understanding how practical and scientific work have been combined in Malaya to produce results of the highest value, he could not possibly have written as he has done. So far from scientific work being neglected there, it has been so closely associated with practical work that it is, as someone said, an extension of "experimental medicine" that would have delighted the heart of Claude Bernard himself.

How carelessly Colonel Gill reads is shown by an alleged quotation from an address I gave to the Royal Society of Tropical Medicine and Hygiene in 1924. A reference to page 152 of the *Transactions* shows that I said: "They [the Commission on Mian Mir] thought that the work of the immediate future lay in patient and searching investigation, and in careful and continued experiment. With that I entirely agree. . . ." According to Colonel Gill, I stated before the Royal Society of Tropical Medicine in 1924 that "the time was gone 'when patient and searching investigation and careful and continuous experiments' could serve any useful purpose in connexion with malaria." Further comment on Colonel Gill's accuracy is unnecessary.

In closing I should like to whisper in his ear that the time for talking of "unsubstantiated claims" and saying that "it cannot be done" is passed, and that some of the more far-seeing in his service are wondering if it is the time to say, "We have been doing it all the time."—I am, etc.,

Luanshya, Northern Rhodesia, May 31st. MALCOLM WATSON.

EXCRETION UROGRAPHY.

SIR,—In a recent discussion on excretion urography at the Royal Society of Medicine one of the speakers is reported to have stated that "no local cellulitis or reaction results, even if some does leak from the vein, so that 'bad arms,' such as occasionally result from tetraiodophenolphthalein, need not be feared." Since this form of radiological investigation would appear to have a wide field of usefulness, and may be largely exploited in the future, it would be a great mistake if the profession were to be misled by this statement into a false sense of security and resulting carelessness. I have recently seen an extremely severe local reaction after the use of uroselectan resulting in local cellulitis, sloughing, and deep ulceration of the arm—a far more severe reaction, in fact, than I have ever observed after the intravenous administration of tetraiodophenolphthalein—and I consider that a very careful technique should be employed which ensures thoroughly washing out any remains of the drug in the tissues with saline.—I am, etc.,

Hove, June 26th. C. GUY WHORLOW.

STORAGE OF X-RAY FILMS.

SIR,—The fire in an *x*-ray film store, as related by the Duchess of Bedford in your issue of June 28th (p. 1198), can cause no surprise to those who are familiar with the properties of *x*-ray film, or nitro-cellulose. This substance is closely allied to gun-cotton, and is prepared by treating cellulose with nitric and sulphuric acids for certain periods.

It seems remarkable that hospital authorities and radiologists are still allowed to store some hundredweights of these materials in the middle of a great city without any kind of regulation or control. In my own garage I am not allowed to keep more than a small quantity of petrol, while in one of my hospitals I have sufficient inflammable material unprotected to demolish the building in a few moments. My protests to the committee have been in vain. In some hospitals the *x*-ray department is an extremely popular rendezvous with the members of the staff; it is appreciated that this place is one of the few in the hospital where one may smoke without hindrance or control. It cannot be long before a cigarette will be thrown into the nitro-glycerin store and a disaster of the first magnitude herald a stringent Board of Trade control. I do not think it probable that the hospital authorities or the Ministry of Health realize the dangers which can accrue in the storing of celluloid.

An interesting point arises from your correspondent's letter as to whether a lead-lined safe is sufficient protection. I must answer in the negative. Nitro-cellulose materials decompose at a rapid rate at a temperature of 100° C., even in the absence of air, the decomposition being exothermic. For this reason spontaneous combustion can occur, the oxygen being supplied by the products of combustion. In the event of celluloid being heated to higher temperatures, decomposition can be so rapid as to lead to explosion. Glowing cigarettes are sufficient to ignite films, and heated water pipes will produce the same effects with an increased time period. The matter has been carefully considered in America, where it will be recalled a large number of patients lost their lives in an *x*-ray film store fire last year.

The only secure manner in which x-ray films may be stored is by enclosing them in a number of fire-proof and explosion-proof safes. These should be in turn ventilated by a shaft running to the open air, the whole unit being designed and installed under the guidance of one who is competent to advise.—I am, etc.,

London, W.1, June 30th. E. J. H. ROTH.

THE OCCIPITO-POSTERIOR CASE.

SIR,—I was interested to read Dr. A. H. D. Smith's letter in last week's issue of the *British Medical Journal* (p. 1196). I think that probably the face presentation was produced in the process of rotation and subsequent traction with forceps. This has happened in a few of my cases, but I have been able to rectify it. Care should be taken after rotation to see that the head is flexed.

I was called in yesterday to an occipito-posterior case. I did not see the case until late, and was able, with difficulty, to rotate the head. Owing to a contracted pelvis forceps were difficult to apply and kept slipping. I left the patient for a couple of hours, and on my return had no difficulty in delivering a living child. The amount of moulding was very marked, the head being cylindrical. I find leaving the case for a couple of hours very useful, and, in these days of motor cars, not as difficult as it used to be.

Dr. Smith was good enough to mention my name with reference to inserting the upper blade first; it seems to me to be the natural thing to do. This is the most difficult one, especially in difficult cases, and the presence of the lower adds to this. In the old days the assistance available was often very limited. I find that the upper blade, when introduced, hangs naturally forward and the lower is easily put in behind; whereas if the lower blade is introduced first this has to be kept well back by an assistant while the upper is introduced. It seems hardly necessary to say that the lower blade must be inserted behind the upper, but I was giving an anaesthetic for a friend and suggested his trying this method. I found him struggling to lock the forceps; he had inserted the lower blade in front of the upper.—I am, etc.,

Stafford, June 30th. JOHN D. DAVIES.

SIR,—In your issue of June 28th (p. 1196) Dr. Williams recommends Kielland's forceps for rotating the foetal head in occipito-posterior positions. From a limited experience of this instrument I think it is an efficient substitute for, and in some respects superior to, the classical axis-traction forceps.

In many occipito-posterior cases the occiput rotates anteriorly during labour, and in cases where it fails to do so spontaneous delivery frequently occurs. If the condition is found during pregnancy, troublesome and uncertain methods of rectification should never be employed; indeed, the condition need not be definitely diagnosed during pregnancy or even during labour provided progress is satisfactory. When labour occurs the head is frequently found well down in the pelvis at an early stage; if it remains high, disproportion should be suspected. If arrest occurs in the second stage in a primigravida the diagnosis is sometimes difficult, as a large caput frequently obscures the fontanelles. In a multipara it is much easier if examination is not deferred too long. In all cases definite diagnosis is possible by palpating the ear under anaesthesia prior to application of the forceps.

The classical axis-traction forceps, which can be applied either in relation to the head or the pelvis, will effect delivery in practically all cases. If traction is carefully applied a complete tear of the perineum should never occur. If Kielland's forceps is used for rotation it is applied in relation to the foetal head with the indicators pointing backwards. It can be used, however, with the indicators pointing forwards, delivery being completed without rotation. For this particular complication, and for apparently normal cases in which there is undue delay, Kielland's instrument is simpler and safer than the classical forceps.—I am, etc.,

Smethwick, June 30th. E. CONDON, M.B., B.Ch., B.A.O., L.M.

ENDOGENOUS PUERPERAL SEPSIS.

SIR,—Most authorities believe that the main source of puerperal sepsis is the mismanaged maternity case and that sepsis is introduced from without. A minority hold that infection from within is at least as important, and that teeth and tonsils are the main source of infection. The following history of a case of sepsis recently under my care is illuminating.

Mrs. T., aged 36, a healthy-looking woman, was confined on April 20th, under ideal home conditions, a trained nurse being in attendance as well as myself. She was a 2-para, the first confinement having been normal and delivery spontaneous. Pregnancy ran a normal course and no abnormal features were noted. The confinement was short in duration, no vaginal examination was made, and there was no intervention of any kind. On the third day the patient had a rigor, the temperature rose to 104° F. and persisted. On examination nothing was found in the urine, the breasts were normal, and lochia were not offensive. The uterus was undergoing normal involution. At the end of a week examination revealed a mass in the left broad ligament which by the fourteenth day had become palpable on abdominal examination. The lochia had now become definitely offensive. A diagnosis of an infected fibroid was made and the patient was removed to a nursing home for operation.

On the fifteenth day abdominal section was performed. The left ovary, broad ligament, and tube were acutely inflamed. The ovary was tense, the size of an orange, and full of pus. The broad ligament was thickened with cellulitis and phlebitis, which extended a considerable distance up the ovarian vein. The uterus was quite small and was well involuted. At the junction of tube and fundus on both sides there was a tense swelling, the size of a walnut, full of pus. The interior of the uterus was perfectly clean and smooth. The right broad ligament, tube, and ovary appeared to be normal. Hysterectomy being the only possible hope, I accordingly performed a subtotal hysterectomy and inserted a tube into the left pelvic pouch. The temperature gradually settled and the patient made a good recovery. Examination of the pus showed the infecting organism to be a streptococcus.

Examination of the patient's mouth showed that her lower six incisors and bicuspids were in a very bad condition, and when convalescence was established the teeth were extracted and forwarded to Dr. Loveday of Manchester for examination and report. Culture gave a copious growth of haemolytic *Streptococcus longus* of three main types: (1) Predominant, a small haemolytic *Streptococcus longus*; (2) a very haemolytic large *Streptococcus longus* in smooth colonies; (3) a haemolytic *Streptococcus longus* of large type in rough colonies.

The evidence in this case strongly suggests that the source of infection was the teeth via the blood stream.—I am, etc.,

Kendal, June 26th. C. M. CRAIG, M.D., D.P.H., Honorary Surgeon, Westmorland County Hospital.

ETHER CONVULSIONS.

SIR,—I feel indebted, as will everyone interested in the subject, to Dr. Stanley Sykes for his article on ether convulsions in the *Journal* of June 21st (p. 1128). In order to help in elucidating the problem of their cause I should like to categorize all the signs and circumstances of those cases I have come into contact with, which will form an essential supplement to his summary. Before doing so I would say again that I am sure that the condition can be easily prevented, and (I am tempted to reassert) cured, provided its onset is immediately recognized.

In many administrations removal at intervals of the frame and coverings, so allowing free access of fresh air, has the effect of quieting respiration, due in part, I suppose, to lessening the carbon dioxide concentration, and in part to stopping the ether vapour. It was this effect that led me to believe that an assumed hypercapnia was the chief cause of the convulsions, but in view of Dr. Langton Hewer's statement (mentioned by Dr. Sykes) that they have occurred during endotracheal administration the theory would become untenable. I should, however, be glad to hear full particulars from Dr. Hewer. Other considerations, too, are against such a theory; but in spite of this I feel that faulty technique in the direction of overmuch covering, and a forcing of the anaesthetic at the end of the second stage of induction, most often appears as the effective cause.

(*a*) The patients are children and young adults almost always (my first case was a middle-aged woman).

(*b*) They nearly always suffer from a bacterial toxaemia (generally acute infection), but there are quite definite exceptions.

(*c*) They usually have a pyrexia.

(*d*) Pyrexia often develops, apparently as a result of the convulsions.

(*e*) In most cases ether has been the only agent used. In one, in which convulsions were beginning, none had been given.

(*f*) History of epilepsy has not always been sought, but has then been negative.

(*g*) Oxygen has generally, or always, been added.

(*h*) As a rule, if not always, the face of the patient has been suffused with blood, and he has shown the sthenic appearance common during etherization. Blood pressure has not been taken.

(*i*) The onset usually is early during the operation, when anaesthesia is fully established. In many cases, however, it is later.

(*j*) It begins either by energetic breathing becoming irregular (especially inspiration), or in a twitching of the mouth or of the eyelids, or by a flexion of the elbow, first on one side and then on the other, causing a steady rise of hand and forearm from the table (I have seen this twice as the first sign), or in a twitching of arms or shoulders. Occasionally cyanosis is the first sign.

(*k*) Blueness (the breathing being interfered with by the convulsions) becomes increasingly evident.

(*l*) Deepening of the narcosis does more harm than good.

(*m*) Convulsions are severe, sustained, general, and epileptiform.

(*n*) They are always typical.

(*o*) Death occurs from exhaustion, insufficient oxygenation persisting until the end, in spite of cessation of convulsions and plenteous supply of oxygen.

(*p*) It seems probable that the issue of every case would be fatal if the administration were not suspended or the method altered.

(*q*) Recovery from the narcosis is delayed, even after a short attack.

(*r*) Two cases (I have heard of another)—all fatal—had recurrence of the convulsions later on in bed, one after an apparently complete recovery.

(*s*) In one case I purposely resumed the administration of ether by the same method, without ill effect.

These considerations may refute all theories so far advanced; but if faulty method, developed in recent years, be (as I feel confident) the chief factor, in what way could it operate? Dr. Sykes thinks the oxygen should be analysed, but having regard to the case just mentioned (*s*) it could hardly throw any light on the subject.—I am, etc.,

Victoria Park, Manchester, June 24th. K. B. PINSON.

SIR,—Dr. Stanley Sykes's interesting article on ether convulsions in your issue of June 21st, and the apparent rarity of the condition, prompt me to record a case which I had a few weeks ago, and which presents one or two interesting features in connexion with the various hypotheses which have been put forward to explain the etiology of this condition.

The patient was a girl, aged 17, who was having a fractured tibia plated. The fracture had previously been compound, and, though the wound was clean at the time of operation, the patient had been running a temperature for some time. Ether and oxygen were administered by Boyle's apparatus and the anaesthetic proceeded uneventfully for over half an hour, except that the patient, though not very deeply anaesthetized, breathed very shallowly, a fact which I attributed partly to the liberal supply of oxygen which she was having. The patient then started to have clonic spasms, which increased in severity and became generalized.

I must confess that at the time I was not fully aware of the serious prognosis of the condition, and, as the operation was by then almost over, I turned off the ether and turned the oxygen on full, with the idea of washing out any remaining ether vapour from the respiratory passages. The spasms lasted for about two minutes and then became less and ceased, and the patient was apparently none the worse. At a previous operation three weeks previously, at which ether was used, there were no spasms.

This case, which must be classed as one of the "septic" type, occurring, like most others, in a young adult, presents two interesting features. The fact that, at a previous operation three weeks previously, no spasms occurred is strongly against the "idiosyncrasy" hypothesis, though it may be supposed that the toxaemia following the compound fracture increased the susceptibility of the patient to ether clonus. The fact that the spasms ceased actually while the patient was being given oxygen "full blast" would appear to be against Mennell's "over-oxygenation" hypothesis.—I am, etc.,

Addenbrooke's Hospital, Cambridge, June 26th. J. I. SAPWELL.

INVASION OF THE GALL-BLADDER BY ASCARIS LUMBRICOIDES.

SIR,—Drs. Wood Power and Johnston (*British Medical Journal* (June 14th, p. 1086) find that, in man, invasion of bile ducts by *Ascaris lumbricoides* is not infrequent, whereas invasion of the gall-bladder is rare. In young swine, *Ascaris lumbricoides* is frequently found in the small intestine, whence it commonly migrates into the bile ducts; but invasion of the gall-bladder and of the pancreatic duct is, I believe, rare. Two specimens in the Museum of Pathology, Royal Veterinary College, demonstrate very clearly migration of the worms from the duodenum up the bile ducts into the gall-bladder and hepatic ducts. No. A12c2.0 shows chronic cholecystitis and cholangitis, with ascarids thickly packed in the distended bile duct and lying free within the gall-bladder and hepatic ducts. The subject was a young adult male pig, having a history of progressive emaciation terminating in refusal of food for three days, when it was slaughtered. There was no jaundice. No. A12c2.01 shows a similar invasion, but the inflammatory changes in the biliary tract are slight. The subject was a male pig, aged 11 weeks, which was slaughtered for food as a healthy animal; there was no jaundice.—I am, etc.,

Department of Pathology, Royal Veterinary College, N.W., June 24th. TOM HARE.

AMPUTATION AND ARTIFICIAL LIMBS.

SIR,—I was much interested in the report of the Royal Society of Medicine's discussion on amputations (*Journal*, April 12th, p. 693), and as an amputee I should like to give my ideas about the subject. I quite agree about the Syme amputation; it has not been a success on the whole. With high amputations I believe in giving all the end-bearing possible; if there is not sufficient below the knee one should try to give a knee-bearing. It may not look so pretty and the prosthesis is longer than the natural leg, but the patient can walk and work far better. One of the best thigh amputations I know was done by Dr. R. B. Wade about 1918 in Sydney. He amputated about three inches above the knee and tacked the patella on to the end. The stump is excellent, and all the weight is taken on the end, with the result that the amputee can stand all day, walk long distances, and play a really good game of doubles tennis. His weight is about 13 stone.

I have seen all the fitting at the Commonwealth Artificial Limb Factory for seven years, where all the legs, arms, surgical boots, and appliances are made for the soldiers. With an end-bearing stump fitting is easy, as there is less weight and friction on the tissues about the ischium. I have a bad stump and have to take all the weight on the ischium, and in the summer, with the temperature between 75° and 95° F., and humidity anything up to 90, the skin chafes and gets sore. It is most important to provide as large an area for pressure about the ischium as possible to save chafing. A good ointment for rubs and pimples is yellow vaseline with 20 per cent. quinine sulphate; a little should be put on the sock and allowed to rub in during the day.—I am, etc.,

Sydney, N.S.W., May 22nd. A. H. MOSELEY, D.S.O., M.B., Ch.M., D.P.H.

HEREDITARY FACTOR IN HAY FEVER.

SIR,—There is some evidence that susceptibility to hay fever is an hereditary character. It is also a character usually well marked and comparatively easy to trace among members of a family. At this time of the year many medical practitioners must meet with hay fever patients whose genetical history could be discovered without difficulty. Should any of your readers come across such cases and be willing to obtain records of the incidence of hay fever among members of the family over, say, four generations, I would be interested to receive such records, which I am collecting.—I am, etc.,

Bacteriology Department, Rothamsted Experimental Station, Harpenden, June 27th. H. G. THORNTON, D.Sc.

DRUG TREATMENT OF MEASLES.

SIR,—I should like to endorse the remarks made by Dr. H. J. Clutterbuck in the *British Medical Journal* of June 21st regarding the treatment of measles by the powder consisting of aceto-salicylic acid, compound ipecacuanha powder, and phenacetin. The results have been most gratifying. Two years ago I had the opportunity of using this method of treatment in fifty cases. There was a very rapid improvement in almost every case. The cough was markedly relieved and it was seldom necessary to give the powder during the night as the patients slept well. All these cases occurred in boys between the ages of 10 and 18 years. Up to the age of 16 the doses given were aceto-salicylic acid 2½ grains, pulv. ipecac. co. 1¼ grains, phenacetin 1¼ grains every four hours. In patients over 16 the amounts were doubled.—I am, etc.,

Holt, Norfolk, June 23rd. A. S. HENDRIE, M.B.Ed.

SPINAL ANAESTHETICS.

SIR,—Mr. H. H. MacWilliam, in a letter published in the *Journal* of June 21st (p. 1154), has pointed out a slight inaccuracy in my article on spinal anaesthesia (June 14th, p. 1088). The statement that planocain "is really strychnine-free spinocain" is perhaps not quite correct. The planocain we used was not the same as the product usually supplied under that name by May and Baker, and which Mr. MacWilliam has probably used in his cases. These solutions have the following formulae:

Solution No. 1.

Planocain (novocain)	0.2 gm.
Gliadin	0.00€5 gm.
Alcohol (5 per cent.)	to 2 c.cm.

Solution No. 2.

Ephedrine hydrochlor.	0.05 gm.
Planocain	0.01 gm.
Normal saline	to 1 c.cm.

Recently May and Baker have issued a new product called duracaine light solution, made up in 3 c.cm. and 1 c.cm. ampoules respectively. The 1 c.cm. ampoule has the same formula as the No. 2 solution quoted above, but the 3 c.cm. ampoule contains the following constituents:

Planocain	0.1 gm. per c.cm.
Gliadin	0.00325 gm. per c.cm.
Ethyl alcohol (15 per cent.)	... to 3 c.cm.

We have used duracaine in the last thirty cases, and have found it the most satisfactory of any solution so far.—I am, etc.,

Norfolk and Norwich Hospital, June 23rd. R. A. GRANT.

JAMES MACKENZIE.

SIR,—With reference to my lecture on "James Mackenzie and his message," which was published in your issue of June 7th, I should like you to correct one small error. On page 1035, among several names of men associated with Mackenzie, occurs that of Cushing. This, of course, should read Cushny. I was referring to the late Professor Cushny, whose work on digitalis is so well known.—I am, etc.,

Liverpool, June 24th. JOHN HAY.

Medico-Legal.

AUTOMATIC MACHINES FOR SALE OF DRUGS.

PHARMACEUTICAL SOCIETY'S TEST CASE.

THE Pharmaceutical Society of Great Britain, which recently issued a warning on the dangers of automatic machines for the sale of drugs (*British Medical Journal*, January 18th, p. 134), brought, on April 21st, a friendly action at the Wood Green County Court, against Harry Ronald Watkinson, a chemist and a member of the society, of Lordship Lane, Tottenham, claiming £5 penalty for breach of the Poisons and Pharmacy Act, 1908.

Mr. Glyn Jones, for the Pharmaceutical Society, sought the ruling of the judge (Judge Crawford) on a new and important point arising under that Act. He said that Mr. Watkinson, the defendant, was a loyal member of the society, and no reflection was cast on him as a chemist, but the society thought it undesirable that the public should have access, without the intervention of a qualified chemist, to all manner of poisons which might be offered for sale by means of automatic machines. The question was, whether the sale of poisons from these machines was lawful. Bottles of lysol, bearing a statement to the effect that they contained 50 per cent. of cresol, and labelled "Poison," were bought by an inspector in the employ of the society from an automatic machine outside Watkinson's shop. The point made was that the sale of these poisons was the carrying on of the business of a chemist and druggist, which must, in accordance with the statute, be conducted by a qualified chemist, which an automatic machine was not. He added that the use of these machines was enormously extensive, and if they were contrary to law the decision of the court would be of far-reaching importance.

At an adjourned hearing, on May 21st, Mr. George Pollock, representing the chemist, said that his defence was that, although the sale complained of fell within the range of general supervision, it did not fall within the particular point of supervision required for a sale of poison for which the purchaser had to sign a book recording the sale of dangerous drugs.

Judge Crawford gave a considered judgement on June 26th. He found in favour of the Pharmaceutical Society for the amount claimed (£5) with costs. He said that the defendant, in his view, carried on the business of a chemist and druggist through the medium of an automatic machine, from which he sold to the public a dangerous poison. The evidence satisfied him that any child tall enough to place a coin in the slot and take a bottle of lysol could do so without the knowledge of the defendant or any person in his employment. Beyond all question, this ought not to be allowed. A highly qualified analyst had found that the bottle contained over 47 per cent. of homologues of carbolic acid, and no supervision had been exercised over the sale of the poison. The sale of such a dangerous poison as lysol certainly ought to be part of the business of a chemist and druggist rather than of any other trader.

Obituary.

DR. CECIL WEBB-JOHNSON, who died in London on June 23rd, was born in 1879 at Stoke-on-Trent, where his father, Dr. Samuel Johnson, was medical officer of health; his brother is Mr. Alfred Webb-Johnson, surgeon to the Middlesex Hospital. He was educated at Owens College, Manchester, and the London Hospital, graduating M.B., Ch.B.Manch. in 1903. After serving as clinical assistant at the Chelsea Hospital for Women, he was appointed, in 1906, assistant medical officer to the Staffordshire County Asylum. For some years before the war he had held a commission as Captain R.A.M.C., T.F., and at the Annual Meeting of the British Medical Association at Aberdeen in 1914 he acted as joint honorary secretary of the Section of Naval and Military Medicine and Surgery, opening a discussion on common ailments in camp, their prevention and treatment. After the outbreak of war he was sent to India, where he served with the rank of major, and held in turn the posts of civil surgeon and officer in charge of the station hospital at Dum-Dum; specialist in midwifery and diseases of women and children, 8th Lucknow Division; and medical officer at station hospitals in Calcutta, Lucknow, and Allahabad. On returning to England in 1919 he began private practice in London, and was for some years clinical assistant at the National Hospital for Diseases of the Heart. The interest he had taken while in India in dietetics and disorders of metabolism led him to write a number of popular works on diet, obesity, and kindred subjects. Dr. Cecil Webb-Johnson was also well known as a composer of waltz tunes and other light musical pieces.

We regret to record the sudden death, on June 26th, of Dr. C. J. R. MACFADDEN of Hampstead, at the age of 59. He was educated at the University of Edinburgh, where he graduated M.B., C.M. in 1894, proceeding M.D. four years later. He held the appointments of medical officer to the Hampstead Provident Dispensary, divisional surgeon to the Metropolitan Police since 1919, and medical referee under the Workmen's Compensation Act for the district of the Marylebone County Court. He was also assistant commissioner of the Prince of Wales's district of the St. John Ambulance Brigade, and honorary life member, examiner,

and lecturer of the St. John Ambulance Association. He was a member of the executive committee of the Hampstead Division of the British Medical Association, and one of the representatives of the Division on the council of the Metropolitan Counties Branch, and was an ex-president of the Hampstead Medical Society. Dr. MacFadden had served as surgeon to the Cedar Lawn Military Hospital, medical officer in charge of the American Hospital, Caenwood Towers, medical officer of the Officers' Recuperative Hostel, Oakhill Lodge, and surgeon to the British Red Cross Hospital, Bulgarian Relief Section, in the second Balkan war, and was appointed Chevalier avec Couronne de l'Ordre du Mérite Civil du Bulgarie. He took great interest in local affairs and was a member of the Hampstead Borough Council for thirteen years, during which period he had served on a number of committees. He was chairman of the Maternity and Child Welfare Committee for two and a half years, and chairman of the Public Health Committee from 1920 to 1922, and again since 1929. On the day of his death he had been discussing with the officials a report of his committee till 5 p.m., and subsequently attended a patient. At the meeting of the town council, held on the evening of June 26th, when the mayor announced the sudden death of Dr. MacFadden, the members stood in silence as a sign of respect. For his services in connexion with the European war he received the decoration of O.B.E. Dr. MacFadden is survived by his widow, one son, and one daughter.

Medical Notes in Parliament.

[FROM OUR PARLIAMENTARY CORRESPONDENT.]

THE House of Commons gave three days this week to the committee stage of the Finance Bill. A discussion on housing arose on June 30th, and July 4th was set aside for the report stage of the Road Traffic Bill. Consideration of the Housing Bill by a standing committee was completed on July 1st The House of Lords advanced several minor bills during the week.

The Parliamentary Medical Committee met on July 1st and arranged to send a deputation to the Minister of Health next day to advocate the establishment of a central advisory committee on rheumatism clinics.

On July 1st Mr. R. J. Russell presented a bill to amend the Food and Drugs (Adulteration) Act, 1928, and to control the sale of cheese other than whole-milk cheese.

The Hours of Industrial Employment Bill has been withdrawn.

Miners' Nystagmus.

On July 1st Mr. SHINWELL told Miss Lee that miners suffering from nystagmus were in the same position under the Workmen's Compensation Acts as workmen disabled by accident or other industrial disease. He was aware of the difficulties to which they were exposed in obtaining re-employment, particularly in the present condition of the industry, and his Department was still considering with the Home Office what steps might be taken to help them in this respect. Clearly, the best remedy was to diminish the incidence of the disease, and investigations with that object were in progress. While medical opinion was by no means unanimous, it was generally agreed that defective light was a contributing factor, and it was satisfactory to note that, with the encouragement of his Department, improved lamps were being introduced at many collieries.

Housing.

In reply to Sir Kingsley Wood, on June 25th, Mr. GREENWOOD stated that, during the year ended March 31st, 1928, 18 slum clearance schemes had been confirmed, 8 completed, and 98 were in course of execution at the end of the period. During the following year 10 schemes were confirmed, 14 completed, and 94 were in execution. Up to March 30th, 1930, 17 schemes had been completed and 77 were in execution. The number of buildings acquired by local authorities in approved slum clearance schemes for the period between June 30th, 1929, and March 31st, 1930, was approximately 700. Mr. Greenwood further said, on June 25th, that he was aware of the overcrowded condition of many tenements, but had not received specific reports relating to their verminous condition. He did not propose to seek further powers under Section 46 of the Public Health Act, 1925, as local authorities had found their powers adequate, and there was no general demand for further legislation.

On June 30th the House of Commons in committee discussed the vote of the Ministry of Health for housing and administration under the National Health Insurance Acts.

Dr. VERNON DAVIES said that of all the failures of the Government the most colossal was that in regard to housing.

Viscountess ASTOR asked if the Ministry of Health had considered the question of securing sites for nursery schools. She also asked what had been done in regard to the prevention of maternal mortality. At present 3,000 women died every year in childbirth, and some members had a suspicion that the money which might have gone towards the work of prevention had been spent in other ways.

Miss LAWRENCE, replying to the debate, said it was true that the Government advised local authorities to hold their hands in regard to slum clearance until the new Housing Bill had been passed. The Government was proposing a shortening of procedure, and considered that the local authorities would gain by waiting for it.

National Health Insurance.—Mr. GREENWOOD told Mr. Albery and Sir Kingsley Wood, on June 26th, that he had not received any resolution from the recent co-operative congress on the continuance of the regulations of the Ministry of Health prohibiting the payment of co-operative dividend on national health insurance prescriptions, but he was aware of the discussion which took place, and the matter was receiving his attention.

Silicosis in Carmarthenshire.—Mr. SHINWELL, replying to Mr. Hopkin on July 1st, said that the inquiry by the medical officer of the Mines Department into silicosis in the Cross Hands district of Carmarthenshire was proving much more laborious than had been anticipated. Although a great deal of relevant data had been collected, the results on examination indicated the necessity for further inquiry.

Cost of a National Maternity Service.—On July 1st Mr. GREENWOOD told Mr. Freeman that data required for framing even an approximate estimate of the cost of providing a national maternity service, ensuring the services of doctor, midwife, and anaesthetic administration, were not yet available.

Mental Hospitals.—Mr. OLIVER BALDWIN asked the Minister of Health, on June 26th, to consider setting up medico-psychological departments in mental asylums, both criminal and non-criminal, in order to attempt the effecting of cures. Mr. GREENWOOD said he could not consider the proposal without a more precise indication of the proposed department, and of the necessity for its establishment, having regard to the medical services already available in mental hospitals.

Private Mental Institutions.—Replying to Mr. Maclean, on June 26th, Mr. GREENWOOD said the conditions under which patients were treated in private mental institutions were examined by the Visiting Commissioners of the Board of Control, who had a duty to inquire, among other things, into the fees paid. The Commissioners satisfied themselves that the fees paid were generally reasonable for the accommodation and treatment supplied. He did not propose to take power to compel licensees to submit their accounts to a Government department for examination.

Lunacy and Divorce.—Mr. MACDONALD stated, on June 30th, that he was unable this session to grant facilities for the passage of a bill to make certified lunacy of five years and upwards a ground for divorce.

Physically Defective Children.—In a reply to Mr. Foot, on June 26th, Sir CHARLES TREVELYAN stated there were 557 blind children under the age of 16 not attending any school or institution on December 31st, 1929. The corresponding number of deaf children was 305, and of cripples 5,461. These figures included children below school age and those temporarily prevented from attending special schools, and there was no need for special accommodation.

Prevalence of Mosquitos.—On June 24th Miss SUSAN LAWRENCE, replying to Sir W. Davison, said that the Minister of Health was advised that the number of mosquitos in this country fluctuated from year to year according to the climatic conditions, but did not show any general increase. In the present year some species (especially the sylvan species) were unusually prevalent. The Ministry of Health, in collaboration with the Natural History Museum, had given attention to this matter for some years past, and a pamphlet on *British Mosquitos and their Control* had been published, which contained advice on the best methods of combating mosquito pests. The Ministry was also prepared, on request, to advise local authorities on the matter.

Poisonous Liquor.—Mr. ADAMSON told Mr. McElwee, on July 1st, that he had received a report on "red biddy" from the chief medical officer of the Department of Health for Scotland.

Medical Records of Adolescents.—On July 1st Mr. HORE-BELISHA asked the Minister of Health if his attention had been drawn to a recommendation of the medical officer for Plymouth, in his recent report on the health of that city, that children aged 15 should immediately become insurable, so that their school medical records could be passed to panel doctors, thus avoiding the present year's gap in health supervision. Mr. HAYES, who replied, said that, in the event of provision being made by legislation whereby the minimum age for entry into insurance would coincide with the normal school-leaving age, the question of the transfer of the relevant medical records would receive consideration.

Smoke Abatement.—Mr. GREENWOOD stated, on June 26th, in reply to Sir N. Grattan-Doyle, that 116 local authorities had made by-laws on the subject of smoke abatement. This left 1,652 no manufacturing processes were found. He found it unnecessary to exercise his power of forcing local authorities to make by-laws.

Universities and Colleges.

UNIVERSITY OF OXFORD.

AT the Encaenia held on June 25th the honorary degree of D.Sc. was conferred on Sir Arthur Keith, M.D., F.R.S., Conservator of the Museum of the Royal College of Surgeons of England.

At a congregation held on June 26th the degree of B.M. was conferred on G. Campbell.

Osler Memorial Medal.

The Osler Memorial Medal for 1930 has been awarded to Sir Wilmot P. Herringham, K.C.M.G., C.B., D.M., F.R.C.P. This bronze medal is awarded every five years to the Oxford medical graduate who has, in the opinion of the Board of Awarders, made the most valuable contribution to the science, art, or literature of medicine, and who has not previously received the medal.

The Theodore Williams Scholarship for 1930 has been awarded to Mr. H. N. Davis (University).

UNIVERSITY OF CAMBRIDGE.

THE Master and Fellows of Corpus Christi College have awarded the Copeman Medal for research in medical and biological sciences to Dr. R. Hilton, assistant physician, St. Bartholomew's Hospital. This is the first award of the medal presented by Dr. S. Monckton Copeman, F.R.S., formerly a scholar of the college. It was designed by Mr. T. H. Paget and struck by the Royal Mint.

The following candidates have been approved at the examinations indicated:

M.CHIR.—A. Simpson-Smith, C. I. Tuckett.

THIRD M.B., B.CHIR. (*Part I, Surgery, Midwifery, and Gynaecology*).—N. W. Alexander, H. B. Bagshaw, W. I. Bain, C. O. Barnes, J. H. Beilby, A. T. Blair, O. H. Bostock, H. G. H. Butcher, G. F. Carey, H. M. Chappel, W. F. Church, J. H. Conyers, O. J. C. Cotton, R. M. S. Cross, C. A. de Candole, R. M. Dowdeswell, W. S. Dyson, R. H. Fish, E. D. Forster, H. S. H. Gilmer, C. E. D. H. Goodhart, S. E. F. Gooding, A. H. Gurney, G. Hale, J. H. Hall, C. J. K. Hamilton, F. R. T. Hancock, J. O. Harrison, W. Heath, T. C. Jameson Evans, H. D. B. Kelly, R. O. Lee, J. D. McVean, H. Mallinson, F. E. Pilkington, V. H. Riddell, N. H. L. Ridley, H. E. W. Roberton, M. H. Salaman, J. G. Sleigh, D. J. R. Steen, E. S. Stern, H. C. Stewart, J. W. P. Thompson, A. W. Vaisey, G. W. Whittall, T. D. G. Wilson, F. G. Wood-Smith, R. H. Young. *Women*: E. M. P. Smith, M. Sutcliffe. (*Part II, Principles and Practice of Physic, Pathology, and Pharmacology*): A. F. Alsop, G. O. Barber, J. H. Bentley, R. M. Bolam, F. G. Booker, W. V. Bowman, W. V. Boyle, O. J. C. Cotton, A. C. Crooke, H. Curtis, J. S. S. Fairley, R. H. Fish, W. R. Forrester Wood, I. J. Franklen Evans, G. N. Grose, A. S. Hall, P. E. T. Hancock, H. L. Hoffman, F. W. Holdsworth, L. E. Houghton, E. H. Hudson, M. M. St. G. Johnstone, M. Koettlitz, R. O. Lee, P. G. Levick, A. Lister, D. G. Macdonald, S. McDonald, W. M. Macgregor, F. G. Maitland, R. W. Malim, C. E. P. Markby, H. L. Milles, I. B. Morris, B. C. Nicholson, V. P. Paxon, J. O. Poynton, C. B. Prowse, W. Radcliffe, T. G. Reah, J. Richardson, H. W. Sadlier, J. D. Simpson, G. H. G. Southwell-Sander, R. S. Stacey, E. C. Sugden, C. P. K. Toland, J. C. G. Whitelaw, F. S. Winton. *Woman*: C. H. England.

UNIVERSITY OF LONDON.

KING'S COLLEGE.

DR. J. H. MOYNIHAN has been appointed honorary demonstrator in anatomy.

ST. THOMAS'S HOSPITAL MEDICAL SCHOOL.

H.R.H. the Duke of Connaught presented the prizes to the successful students of St. Thomas's Hospital Medical School on June 26th. In the course of his remarks he recalled the fact that he was present at the laying of the foundation stone, and at the opening of the hospital, of which he was president. He mentioned that £670,000 was now needed for a new school and new out-patient and special department. Professor L. S. Dudgeon, dean of the school, reported that the number of students had never been at a higher level; it was anticipated that the figure might be exceeded next year. The examination records were very satisfactory, as St. Thomas's men showed a percentage of passes well above the average.

UNIVERSITY OF DURHAM.

ON June 26th the honorary degree of D.C.L. was conferred upon Lieut.-General Harold B. Fawcus, C.B., C.M.G., D.S.O., Director-General Army Medical Services.

UNIVERSITY OF MANCHESTER.

THE following appointments are announced: Lecturer in Experimental Physiology, Walker Schlapp, M.B., Ch.B., Ph.D.; Assistant Lecturer in Anatomy, J. M. Yoffey, M.Sc., M.D.; Demonstrators in Anatomy, F. N. Marshall, M.B., Ch.B., D. Sheehan, M.B., Ch.B.; Demonstrator in Human Physiology, L. B. Winter, M.D.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.

A HUNTERIAN Lecture on "Hydatid disease—some interesting complications," illustrated by lantern slides, will be delivered in the theatre of the College, Lincoln's Inn Fields, W.C., by Professor Harold R. Dew on Thursday, July 10th, at 2.45 p.m.

Medical News.

THE Queen has addressed a message of congratulation and goodwill to the National Baby Week Council on the occasion of the fourteenth National Baby Week, which began on Tuesday, July 1st.

THE Fellowship of Medicine and Post-Graduate Medical Association announces that from July 21st to August 3rd an afternoon course in infants' diseases, with special reference to dietetics and nutritional disorders, will be given at the Infants Hospital under the direction of Dr. Eric Pritchard. The sessions will last from 2 to 5 o'clock, and will consist of demonstrations in the out-patients' department, round-table consultations, etc.; visits will be paid to the Nursery Training School, the V.D. centre at Thavies Inn, and the United Dairies' pasteurizing plant at Willesden; fee for the course 3 guineas. As August is generally regarded as a vacation month it is not possible for the Fellowship to arrange for many special courses; but there will be a course lasting one week at the Brompton Hospital from August 11th to 16th, when instruction will be given throughout the day from 10 a.m.; and an afternoon and evening course in genito-urinary diseases at All Saints' Hospital, Vauxhall Bridge Road, S.W., from August 5th to 30th. This course will consist of demonstrations on cases, cystoscopies, etc.; fee £2 12s. 6d. For those not desirous of following a special course, the Fellowship provides a general course admitting to the clinical practice of its associated hospitals. A programme setting out the clinics under subject headings is provided, leaving the holder of the comprehensive ticket free to make out his own time-table. The course can be begun on any day of any week. Graduates should write to the Fellowship of Medicine, 1, Wimpole Street, W.1, for all syllabuses and tickets of admission.

THE nineteenth annual meeting of the British Waterworks Association will be held in Liverpool from July 9th to 11th inclusive. Among the papers to be read is one by Professor J. M. Beattie, bacteriologist to the City and Port of Liverpool, on the value of regular systematic examination of water, with special reference to the interpretation of results.

MR. HENRY TONKS, F.R.C.S., has just retired from the Slade Professorship of Fine Art in the University of London, which he had held since 1917. His inspiring work as a teacher at the Slade School during the past forty years, and his own accomplishment as an artist in various mediums, formed the subject of a valedictory leading article in the *Times* of June 25th.

THE results of an investigation into the reflection from road surfaces have been published by the Department of Scientific and Industrial Research. The object of the inquiry was to obtain more precise data in regard to the efficacy of present systems of street lighting, which generally assume that the brightness of a road surface is approximately proportional to its illumination. Recent studies of the subject, particularly in America, have indicated that uniformity of illumination of a road surface does not imply a uniform brightness—a factor involving the consideration of angles of light incidence and of different lines of view. Thus the driver of a vehicle is chiefly concerned with the appearance of a street a considerable distance ahead. The present investigation consisted of a systematic series of measurements of the reflection factors of four different kinds of road surfaces in common use in this country. In some instances, where the incidence of the light was very oblique, the brightness was found to be several hundred times as great as that based on the assumption of perfect diffusion. Some practical applications of the theory are given in the report, which is illustrated by graphs and diagrams. Copies are obtainable at H.M. Stationery Office, price 6d.

AT a meeting of the Paddington Medical Society to be held at 3 p.m. on July 8th, at the Great Western Hotel, Paddington, Dr. G. E. Oates will deliver an address on public health topics of general interest. A resolution for the appointment of a section in connexion with the National Health Insurance Acts will be considered and reports will be received from representatives on other bodies. Membership of the society is open to all medical practitioners residing or practising in the Metropolitan borough of Paddington. Particulars may be obtained from the honorary secretary, Dr. J. Cohen, 23, Westbourne Park Road, W.2.

MESSRS. GEORGE ALLEN AND UNWIN, Ltd., have taken over the agency, for Great Britain, Northern Ireland, and the Crown Colonies, of League of Nations publications, hitherto held by Messrs. Constable and Co. Messrs. Allen and Unwin will conduct all League of Nations business from 38, Great Ormond Street, W.C.1 (Museum 1439), and not from 40, Museum Street. The London office of the League of Nations, for all purposes except the sale of publications, remains at 16, Northumberland Avenue, W.C.2.

THE tenth Belgian Congress of Neurology and Psychiatry will be held at Liège, under the presidency of MM. R. Titeca and B. Dujardin, from July 28th to 30th, when the following subjects, among others, will be discussed: Angioneurosis, by MM. Rivry and Moreau; and congenital disturbances of speech, by M. Ley. Further information can be obtained from the general secretary, M. Alphonse Leroy, 18, Rue Beckmann, Liège.

THE sixth Congress of the German Society for the Study of Accidents, Insurance, and Welfare Medicine will be held at Breslau on September 26th and 27th, under the presidency of Dr. P. Jottkowitz. The principal subject for discussion will be trauma and the vertebral column.

THE fourth International Congress for Individual Psychology will be held in Berlin from September 25th to 28th, and will open with an address by Dr. Alfred Adler.

THE Italian Congress of Internal Medicine will be held at Rome in the first fortnight of October, when the following subjects will be discussed: acute pulmonary oedema, introduced by Professor Cesare Frugoni; differential diagnosis between visceral neuroses and organic disease, introduced by Professor Nicolas Pende; diagnosis and treatment of haematuria, in conjunction with the Italian Society of Surgery, introduced by Professor Ferrara and Professor Gino Lasio; military service and constitutional biological and pathological factors, introduced by Major Cassinis.

DURING the first five months of this year there were 132 cases of trichinosis in California, as compared with only 33 in the whole of 1929. Four of the 132 cases were traced to the consumption of smoked bear's flesh.

Letters, Notes, and Answers.

All communications in regard to editorial business should be addressed to ***The EDITOR, British Medical Journal, British Medical Association House, Tavistock Square, W.C.1.***

ORIGINAL ARTICLES and LETTERS forwarded for publication are understood to be offered to the *British Medical Journal* alone unless the contrary be stated. Correspondents who wish notice to be taken of their communications should authenticate them with their names, not necessarily for publication.

Authors desiring REPRINTS of their articles published in the *British Medical Journal* must communicate with the Financial Secretary and Business Manager, British Medical Association House, Tavistock Square, W.C.1, on receipt of proofs.

All communications with reference to ADVERTISEMENTS, as well as orders for copies of the *Journal*, should be addressed to the Financial Secretary and Business Manager.

The ***TELEPHONE NUMBERS*** of the British Medical Association and the *British Medical Journal* are *MUSEUM 9861, 9862, 9863,* and *9864* (internal exchange, four lines).

The ***TELEGRAPHIC ADDRESSES*** are:

EDITOR OF THE *BRITISH MEDICAL JOURNAL*, *Aitiology Westcent, London.*

FINANCIAL SECRETARY AND BUSINESS MANAGER (Advertisements, etc.), *Articulate Westcent, London.*

MEDICAL SECRETARY, *Mediscera Westcent, London.*

The address of the Irish Office of the British Medical Association is 16, South Frederick Street, Dublin (telegrams: *Bacillus, Dublin*; telephone: 62550 Dublin), and of the Scottish Office, 7, Drumsheugh Gardens, Edinburgh (telegrams: *Associate, Edinburgh*; telephone 24361 Edinburgh).

QUERIES AND ANSWERS.

TINNITUS AURIUM.

"J. T." wishes to know the cause of singing in the ear at night with some deafness, but no pain, after driving with the window open in a saloon car. What is the best treatment for this complaint?

*** The following simple suggestions may be made: (1) examine meatus and membrana tympani; (2) inflate Eustachian tube with catheter; (3) close window of car.

INCOME TAX.

Exemption of Residents Abroad.

"T. S." inquires whether income tax ceases to be chargeable on the income of persons leaving this country and residing abroad—for example, in the Channel Islands—if the income is from British Government stock; if so, how the exemption is obtained, and from what date it can be claimed.

*** The general rule is that persons who have no residence in this country are liable in respect of income arising in the United Kingdom, but not in respect of other income. Certain Government stocks, however—for example, the 5 per cent. War Loan—were issued with the undertaking that income tax would not be charged on interest thereon where the beneficial owner was resident abroad. If, therefore, "T. S." terminates his residential connexion with this country—prolonged annual visits might be regarded as keeping that connexion in being—and invests his capital in foreign investments or British 5 per cent. War Loan, he will not be liable to British income tax thereon. If the War Loan stock is held in registered or inscribed form, the interest will be paid in full; if it is in the form of bearer bonds, tax will presumably be deducted and he will have to claim repayment through the authorities at Somerset House. The title to exemption will operate as from April 5th following the termination of his residential connexion with this country.

LETTERS, NOTES, ETC.

THE "COIN-CATCHER": A CORRECTION.

SIR JAMES DUNDAS-GRANT writes: My attitude with regard to the "coin-catcher" and endoscopic extraction is incorrectly represented in the report of the proceedings of the Laryngological Section of the Royal Society of Medicine in the *Journal* of June 28th (p. 1175). My remarks were mainly occupied with the advocacy of the employment of Killian's (or Bruning's) special small laryngoscope for children, with which I have removed a coin from a child's oesophagus when the ordinary-sized instrument had, in the hands of an experienced examiner, failed to expose it.

MEDICAL RELICS OF POLAR ACHIEVEMENTS.

THE makers of history in Polar exploration have been men of various nationalities—English, Scottish, Irish, Australian, Canadian, American, Norwegian, Italian—but they have all relied on British medical equipments. Those who visit the Polar Exhibition which is being held at the Central Hall, Westminster, from July 2nd to 15th, will find an interesting exhibit of the medicine cases of many Arctic and Antarctic explorers. Among these is the medical belt of Fridtjof Nansen, who attempted to drift across the North Pole Basin during 1893-96. What remains of the actual equipment of Jackson, the leader of the Jackson-Harmsworth expedition in 1896, sent to rescue Nansen, is also shown. Amundsen's case, too, is on display, together with, among others, those of Scott, Shackleton, Wilkins, Mawson, Peary, the Scottish National Antarctic Expedition (Bruce), the Canadian Arctic Expedition (Stefansson). All these exhibits are the original "Tabloid" medical equipments supplied by Burroughs Wellcome and Co.

A SCHOOLBOYS' CAMP ON THE BROADS.

DR. H. J. STARLING (Norwich) writes: As it seems to have escaped the attention of public school boys' parents resident in the North, may I ask the hospitality of your columns to explain that the Broads Cruising Association has for the last six years been running a fortnight's camp for public school boys on the Norfolk Broads at Thurne, near Acle. This is a training camp which is run to give its cadet members a preliminary training in boat sailing, knotting, and splicing. The number of the cadets is limited to 35 at one camp, and, together with officers and instructors, a ship's company of about 45 all told can be housed in twelve bell tents and a large marquee, which serves as a mess. Eton, Winchester, Wellington, Gresham, Oundle, St. Paul's, and Epsom, to mention a few schools, have been represented in the past years. The camp is run on naval lines. The hands, as they are termed, are allotted to divisions, and there is keen rivalry between the boats' crews for pride of place. A cadet regatta will be held on August 21st, and many well-known Norfolk racing yachts will be brought along to compete, when tea will be provided in the marquee for relatives and friends. An assistant quartermaster, cook, and mate are engaged to do all the domestic work, so that all the available time may be spent afloat. This year we shall be fortunate in having two medical men on the staff, one of whom will always accompany the fleet. To those parents and boys who may be interested in this scheme, the honorary secretary, Lieut.-Colonel F. M. Thrupp, "Sunny Bank," Oxted, Surrey, will be pleased to supply particulars on receipt of a post card.

NOISE IN HARLEY STREET.

DR. HORACE HILL writes: Could I be allowed to register a protest against the hideous noise at the north end of Harley Street, and ask if anything could be done in the matter? Apart from the impossibility of using any sort of instrument or telephone, the constant din is most bewildering and quite inhibits any concentration.

"ANNALS OF MEDICAL HISTORY."

WE are informed by Messrs. Baillière, Tindall and Cox that the price of a volume of six numbers of the *Annals of Medical History* has been advanced to 50s., instead of 42s., as stated in our review on June 28th (p. 1181).

VACANCIES.

NOTIFICATIONS of offices vacant in universities, medical colleges, and of vacant resident and other appointments at hospitals, will be found at pages 38, 40, 41, 42, 43, 44, 45, 48, and 49 of our advertisement columns, and advertisements as to partnerships, assistantships, and locumtenencies at pages 46 and 47.

A short summary of vacant posts notified in the advertisement columns appears in the *Supplement* at page 7.

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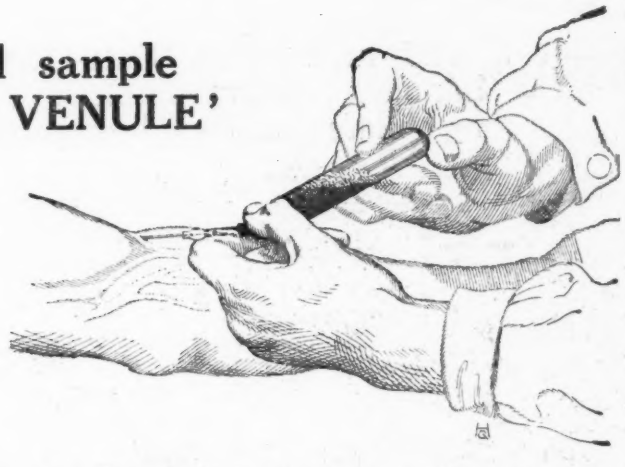

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